Access DB# 53052

SEARCH REQUEST FORM

Scientific and Technical Information Center

Requester's Full Name: LAN VINH Examiner #: 76531 Date: 10/11/2001
Art Unit: 1765 Phone Number 305-6302 Serial Number: 09/206027
Mail Box and Bldg/Room Location: 10D21 CP3 Results Format Preferred (circle) PAPER DISK E-MAIL

If more than one search is submitted, please prioritize searches in order of need.

****

Please provide a detailed statement of the search topic, and describe as specifically as possible the subject matter to be searched. Include the elected species or structures, keywords, synonyms, acronyms, and registry numbers, and combine with the concept or utility of the invention. Define any terms that may have a special meaning. Give examples or relevant citations, authors, etc, if known. Please attach a copy of the cover sheet, pertinent claims, and abstract.

Title of Invention: PLASMA PRECLEAN WITH ARGON, HELIUM, AND HYDROGEN GAS

Inventors (please provide full names): BARNEY M COHEN, KENNY KING TAI NGAN, XIANGBING LI

Earliest Priority Filing Date: 12/4/1998

**For Sequence Searches Only* Please include all pertinent information (parent, child, divisional, or issued patent numbers) along with the appropriate serial number.*

EXPOSING A SUBSTRATE (SEMICONDUCTOR WAFER) TO A PLASMA CONTAINS ONLY ARGON (AR), HELIUM (He) and HYDROGEN (H_2)

****

STAFF USE ONLY		Type of Search		Vendors and cost where applicable	
Searcher:	EJ	NA Sequence (#)		STN	$94.76
Searcher Phone #:		AA Sequence (#)		Dialog	
Searcher Location:		Structure (#)	✓ (1)	Questel/Orbit	
Date Searcher Picked Up:		Bibliographic	✓ (and)	Dr.Link	
Date Completed:	10-17-01	Litigation		Lexis/Nexis	
Searcher Prep & Review Time:	10	Fulltext		Sequence Systems	
~~Clerical Prep Time:~~		Patent Family		WWW/Internet	
Online Time:	60	Other		Other (specify)	

PTO-1590 (1-2000)

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=> file reg

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=> display history full l1-


     FILE 'REGISTRY' ENTERED AT 14:58:05 ON 17 OCT 2001
                E ARGON/CN
L1            1 SEA ARGON/CN
                E HELIUM/CN
L2            1 SEA HELIUM/CN
                E HYDROGEN/CN
L3            1 SEA HYDROGEN/CN

     FILE 'HCA' ENTERED AT 15:01:11 ON 17 OCT 2001
L4       217269 SEA L1 OR ARGON# OR AR
L5       206814 SEA L2 OR HELIUM# OR HE
L6       438726 SEA L3 OR H2 OR (H OR HYDROGEN#)(2A)(GAS## OR GASIF? OR
                GASEOUS? OR ATM# OR ATMOS? OR INJECT? OR INTRODUC? OR
                NOZZL? OR JET OR JETS OR APPLY? OR APPLIED OR APPLICATION
                ? OR TREAT? OR PRETREAT? OR PROCESS? OR PREPROCESS?)

     FILE 'LCA' ENTERED AT 15:07:28 ON 17 OCT 2001
L7         1939 SEA PLASMA#
L8          441 SEA (ETCH? OR CHASE# OR CHASING# OR ENCHAS? OR ENGRAV?
                OR EMBOSS? OR INCIS? OR IMPRINT? OR IMPRESS? OR ENCAUSTIC
                ?)/BI,AB
L9          432 SEA (ETCH? OR MICROETCH? OR CHASE# OR CHASING# OR
                ENCHAS? OR ENGRAV? OR MICROENGRAV? OR EMBOSS? OR INCISE#
                 OR INCISING# OR IMPRINT? OR IMPRESS? OR ENCAUSTIC?)/BI,A
                B
L10         973 SEA PRECLEAN? OR CLEAN? OR STERILIZ? OR STERILIS? OR
                DECONTAMINA? OR SANIT? OR HYGIEN? OR DISINFECT? OR
                SCRUB? OR SCOUR? OR DEGREAS?

     FILE 'HCA' ENTERED AT 15:14:33 ON 17 OCT 2001
L11        6598 SEA L4 AND L5 AND L6
L12        1010 SEA L11 AND L7
L13         122 SEA L12 AND L9
L14          67 SEA L12 AND L10
L15          21 SEA L13 AND L14

     FILE 'LCA' ENTERED AT 15:17:15 ON 17 OCT 2001
L16         526 SEA (THREE? OR 3 OR TRIPL? OR TREBL? OR TRIAD?)(3A)(COMPO
                NENT? OR CONSTITUENT? OR GAS## OR GASEOUS? OR GASIF? OR
                PART OR PARTS OR PORTION?)

     FILE 'HCA' ENTERED AT 15:22:12 ON 17 OCT 2001
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L17            24 SEA L12 AND L16
L18             4 SEA L17 AND L9
L19             0 SEA L17 AND L10

     FILE 'REGISTRY' ENTERED AT 15:23:36 ON 17 OCT 2001
                  E SILICA/CN
L20             1 SEA SILICA/CN
L21           418 SEA (SI(L)N)/ELS (L) 2/ELC.SUB

     FILE 'HCA' ENTERED AT 15:25:43 ON 17 OCT 2001
L22        583949 SEA L20 OR L21 OR (SILICON OR SI)(W)(OXIDE# OR DIOXIDE#)
                  OR SILICA# OR SIO2 OR (SILICON OR SI)(W)NITRIDE# OR SIN
L23           115 SEA L12 AND L22
L24             4 SEA L17 AND L22
L25            46 SEA L13 AND L22
L26            17 SEA L14 AND L22
L27            10 SEA L25 AND L26

     FILE 'LCA' ENTERED AT 15:27:54 ON 17 OCT 2001
L28         10450 SEA (SUBSTRAT? OR SURFACE? OR BASE# OR SUBSTRUCT? OR
                  UNDERSTRUCT? OR UNDERLAY? OR FOUNDATION? OR PANE? OR
                  DISK? OR DISC# OR WAFER?)/BI,AB

     FILE 'HCA' ENTERED AT 15:28:29 ON 17 OCT 2001
L29         51870 SEA L22(3A)L28
L30            14 SEA L12 AND L29
L31             1 SEA L17 AND L29
L32             6 SEA L18 OR L24 OR L31
L33            10 SEA L27 NOT L32
L34            11 SEA L30 NOT (L32 OR L33)
L35            11 SEA L15 NOT (L32 OR L33 OR L34)
L36            18 SEA L17 NOT (L32 OR L33 OR L34 OR L35)


=> file hca

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=> d l32 1-6 ibib abs hitstr hitind
```

L32 ANSWER 1 OF 6 HCA COPYRIGHT 2001 ACS
ACCESSION NUMBER: 133:343429 HCA
TITLE: **Plasma etching** of silicon
INVENTOR(S): Laermer, Franz; Schilp, Andrea; Elsner, Bernhard
PATENT ASSIGNEE(S): Robert Bosch G.m.b.H., Germany
SOURCE: Ger. Offen., 6 pp.
CODEN: GWXXBX

DOCUMENT TYPE: Patent
LANGUAGE: German
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
DE 19919469	A1	20001102	DE 1999-19919469	19990429
WO 2000067307	A1	20001109	WO 2000-DE821	20000316
W: JP, KR, US				
RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE				
EP 1095400	A1	20010502	EP 2000-929216	20000316
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				

PRIORITY APPLN. INFO.: DE 1999-19919469 A 19990429
WO 2000-DE821 W 20000316

AB **Plasma etching**, esp. anisotropic **plasma etching**, of lateral structures in a Si substrate is carried out by using a process gas. Before and/or during **etching**, side walls of the structures are at least temporarily covered with a passivating material. Typically, (1) a F-supplying **etching** gas contg. ClF3, BrF3, and/or IF5, (2) a passivating material-consuming additive, esp. NF3, and/or (3) an easily ionizable **gas**, esp. **H2**, Ne, or Ne is added to the process gas.

IT **1333-74-0**, **Hydrogen**, uses **7440-37-1**, **Argon**, uses **7440-59-7**, **Helium**, uses **7631-86-9**, **Silica**, uses
(in **process** gas for **plasma etching** of silicon)

RN 1333-74-0 HCA
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H— H

RN 7440-37-1 HCA
CN Argon (8CI, 9CI) (CA INDEX NAME)

Ar

RN 7440-59-7 HCA
CN Helium (7CI, 8CI, 9CI) (CA INDEX NAME)

He

RN 7631-86-9 HCA
CN Silica (7CI, 8CI, 9CI) (CA INDEX NAME)

O=Si=O

IC ICM C23F004-00
CC 76-3 (Electric Phenomena)
ST **plasma etching** silicon
IT **Etching**
(**plasma**; of silicon)
IT 75-46-7, Trifluoromethane 75-73-0, Tetrafluoromethane 76-16-4, Hexafluoroethane 76-19-7, Octafluoropropane 115-25-3, Perfluorocyclobutane 116-15-4, Hexafluoropropene 124-38-9, Carbon dioxide, uses 355-25-9, Decafluorobutane **1333-74-0**, **Hydrogen**, uses 2551-62-4, Sulfur hexafluoride 7440-01-9, Neon, uses **7440-37-1**, **Argon**, uses **7440-59-7**, **Helium**, uses **7631-86-9**, **Silica**, uses 7727-37-9, Nitrogen, uses 7782-44-7, Oxygen, uses 7783-54-2, Nitrogen trifluoride 7783-61-1 7783-66-6, Iodine fluoride (IF5) 7787-71-5, Bromine fluoride (BrF3) 7790-91-2, Chlorine fluoride (ClF3) 10024-97-2, Nitrogen oxide (N2O), uses 10102-43-9, Nitrogen oxide (NO), uses 10102-44-0, Nitrogen oxide (NO2), uses 11104-93-1, Nitrogen oxide, uses
(in **process** gas for **plasma etching** of silicon)
IT 7440-21-3, Silicon, processes
(**plasma etching** of)

REFERENCE COUNT: 6

REFERENCE(S):
(1) Anon; EP 0414373 A2 HCA
(2) Anon; DE 19641288 A1 HCA
(3) Anon; DE 19706682 C2 HCA
(5) Anon; DE 4202447 A1 HCA
(6) Anon; DE 4241045 C1 HCA
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L32 ANSWER 2 OF 6 HCA
ACCESSION NUMBER: 133:245945 HCA
TITLE: Selective dry **etching** of InGaP over GaAs in inductively coupled **plasmas**
AUTHOR(S): Leerungnawarat, P.; Cho, H.; Hays, D. C.; Lee, J. W.; Devre, M. W.; Reelfs, B. H.; Johnson, D.; Sasserath, J. N.; Abernathy, C. R.; Pearton, S. J.
CORPORATE SOURCE: Department of Materials Science and Engineering, University of Florida, Gainesville, FL, 32611, USA
SOURCE: J. Electron. Mater. (2000), 29(5), 586-590
CODEN: JECMA5; ISSN: 0361-5235
PUBLISHER: Minerals, Metals & Materials Society

DOCUMENT TYPE: Journal
LANGUAGE: English

AB By exploiting the relatively high volatility of In **etch** products in CH_4/H_2 discharges, we were able to obtain a max. selectivity for InGaP over GaAs of .apprx.20 at low ion energies and fluxes. **Three** different inert **gas** additives to CH_4/H_2 were examd., with **Ar** producing higher selectivities than **He** or Xe. This process is attractive for selective removal of the InGaP emitter in the fabrication of heterojunction bipolar transistors.

IT **1333-74-0**, Hydrogen, uses **7440-37-1**, **Argon**, uses **7440-59-7**, **Helium**, uses
(selective dry **etching** of InGaP over GaAs in inductively coupled **plasmas**)

RN 1333-74-0 HCA
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

RN 7440-37-1 HCA
CN Argon (8CI, 9CI) (CA INDEX NAME)

Ar

RN 7440-59-7 HCA
CN Helium (7CI, 8CI, 9CI) (CA INDEX NAME)

He

CC 76-11 (Electric Phenomena)
ST dry **etching** gallium indium phosphide arsenide inductively coupled **plasmas**
IT **Etching**
(dry; selective dry **etching** of InGaP over GaAs in inductively coupled **plasmas**)
IT **Etching** kinetics
Heterojunction bipolar transistors
Inductively coupled **plasma**
(selective dry **etching** of InGaP over GaAs in inductively coupled **plasmas**)
IT 1303-00-0, Gallium arsenide (GaAs), processes 12776-63-5, Gallium indium phosphide ($GaInP_2$)
(selective dry **etching** of InGaP over GaAs in inductively coupled **plasmas**)
IT 74-82-8, Methane, uses **1333-74-0**, Hydrogen, uses **7440-37-1**, **Argon**, uses **7440-59-7**,

Helium, uses 7440-63-3, Xenon, uses
(selective dry **etching** of InGaP over GaAs in inductively coupled **plasmas**)

REFERENCE COUNT: 21

REFERENCE(S):
(1) Abernathy, C; Appl Phys Lett 1992, V61, P1092 HCA
(3) Bour, D; Quantum Well Lasers 1993, P415 HCA
(6) Groves, S; Appl Phys Lett 1992, V61, P255 HCA
(8) Hanson, A; IEEE Electron Dev Lett EDL 1993, V14, P25 HCA
(9) Hays, D; Electron Solid-State Lett 1999, V2, P587 HCA
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L32 ANSWER 3 OF 6 HCA
ACCESSION NUMBER: 131:338340 HCA
TITLE: **Plasma** chemical vapor coated transparent and gas-barrier film and laminate for packaging made from the same
INVENTOR(S): Ohoshi, Takanori; Mikami, Koichi
PATENT ASSIGNEE(S): Dainippon Printing Co., Ltd., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 12 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 11322984	A2	19991126	JP 1998-153999	19980519

AB The film comprises a substrate, an inorg. oxide coating layer made from a **plasma** chem.-vapor coating process on one side of the substrate and a gas **plasma** layer from O, **Ar** and/or **He** on the surface of the chem.-vapor deposition layer. Thus, **plasma** chem. deposition coating a biaxially stretched PET film at 10 KW, speed of 100 m/min and at a **gas** flow of 1:**3**:3 slm (std. litter minute) of methamethyldisiloxane, O and **He** mixt. in a vacuum chamber at 5.0 .times. 10-5 m-bar and bonding with a polypropylene film by a polyurethane adhesive gave a laminate showing O permeability 0.8 mL/m2-day at 23.degree. and 90% RH and steam permeability 0.8 g/m2-day at 40.degree. and 100% RH.

IT **1333-74-0**, **Hydrogen**, **processes**
7440-37-1, **Argon**, processes **7440-59-7**,
Helium, processes
(**plasma** chem. vapor coated transparent and gas-barrier film and laminate for packaging made from the same)

RN 1333-74-0 HCA
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H— H

RN 7440-37-1 HCA
CN Argon (8CI, 9CI) (CA INDEX NAME)

Ar

RN 7440-59-7 HCA
CN Helium (7CI, 8CI, 9CI) (CA INDEX NAME)

He

IT **7631-86-9**, **Silicon dioxide**, uses
(**plasma** coating of; **plasma** chem. vapor coated transparent and gas-barrier film and laminate for packaging made from the same)
RN 7631-86-9 HCA
CN Silica (7CI, 8CI, 9CI) (CA INDEX NAME)

O══Si══O

IC ICM C08J007-06
ICS B32B009-00; B32B027-06; B32B027-36; B65D065-40; C08J007-04; C23C016-50
CC 42-2 (Coatings, Inks, and Related Products)
Section cross-reference(s): 38
ST polyester oxygen **helium** hexamethyldisiloxane **plasma** treatment; gas steam barrier packaging film; polypropylene laminate PET gas barrier
IT Polyamides, miscellaneous
(films; **plasma** chem. vapor coated transparent and gas-barrier film and laminate for packaging made from the same)
IT Packaging materials
(gas-impermeable; **plasma** chem. vapor coated transparent and gas-barrier film and laminate for packaging made from the same)
IT Laminated plastics, uses
(**plasma** chem. vapor coated transparent and gas-barrier film and laminate for packaging made from the same)
IT Polyesters, uses
(**plasma** treatment of, laminates; **plasma** chem. vapor coated transparent and gas-barrier film and laminate for packaging made from the same)
IT Polymerization

Vapor deposition process
(**plasma**; **plasma** chem. vapor coated transparent and gas-barrier film and laminate for packaging made from the same)

IT Coating materials
(water-resistant; **plasma** chem. vapor coated transparent and gas-barrier film and laminate for packaging made from the same)

IT 9003-07-0, Polypropylene
(**plasma** chem. vapor coated transparent and gas-barrier film and laminate for packaging made from the same)

IT **1333-74-0**, **Hydrogen**, **processes**
7440-21-3, Silicon, processes **7440-37-1**, **Argon**, processes 7440-44-0, Carbon, processes **7440-59-7**, **Helium**, processes 7782-44-7, Oxygen, processes
(**plasma** chem. vapor coated transparent and gas-barrier film and laminate for packaging made from the same)

IT **7631-86-9**, **Silicon dioxide**, uses
26298-61-3, Hexamethyldisiloxane homopolymer
(**plasma** coating of; **plasma** chem. vapor coated transparent and gas-barrier film and laminate for packaging made from the same)

IT 25038-59-9, PET polymer, uses
(**plasma** treatment of, laminates; **plasma** chem. vapor coated transparent and gas-barrier film and laminate for packaging made from the same)

L32 ANSWER 4 OF 6 HCA COPYRIGHT 2001 ACS
ACCESSION NUMBER: 131:178553 HCA
TITLE: Surface **treatment** by **hydrogen** reduction using water vapor
INVENTOR(S): Takamatsu, Toshiyuki
PATENT ASSIGNEE(S): Mitchell, James W., USA
SOURCE: Jpn. Kokai Tokkyo Koho, 8 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 11233494	A2	19990827	JP 1998-177972	19980521

PRIORITY APPLN. INFO.: JP 1997-366109 19971203

AB Surface treatment of a substrate includes the following steps; (1) setting a substrate in a treatment chamber which is placed lower than a **plasma** generation chamber, (2) introducing a mixt. gas of (a) .gtoreq.1 gas (A) selected from N2 and Group VIIIA elements (**He**, Ne, **Ar**, Kr, Xe, and Rn) and (b) H-free and water vapor-contg. gas, where concn. of the water vapor is lower than that of A, into the **plasma** generation chamber, (3) introducing a **gas** into a gas flow

which is halfway from the **plasma** generation chamber and
the treatment chamber. The gas introduced in the gas flow may
contain a halogen, F, Si, or C. The treatment method, such as
plasma etching or CVD, is performed safely and at
low cost.

IT **7631-86-9**, **Silica**, processes
(deposited layer; **surface treatment** by
H redn. using **H**-free **gas** contg. water
vapor)

RN 7631-86-9 HCA

CN Silica (7CI, 8CI, 9CI) (CA INDEX NAME)

O═Si═O

IT **7440-37-1**, **Argon**, uses **7440-59-7**,
Helium, uses
(surface **treatment** by **H** redn. using **H**
-free **gas** contg. water vapor and)

RN 7440-37-1 HCA

CN Argon (8CI, 9CI) (CA INDEX NAME)

Ar

RN 7440-59-7 HCA

CN Helium (7CI, 8CI, 9CI) (CA INDEX NAME)

He

IC ICM H01L021-3065
ICS C23C016-50; C23F004-00; H01L021-205; H01L021-31

CC 76-11 (Electric Phenomena)
Section cross-reference(s): 75

ST surface **treatment hydrogen** redn water vapor;
plasma etching water vapor nitrogen gas; CVD
plasma ethanol nitrogen carbon film

IT **Etching**
Vapor deposition process
(**plasma**; surface **treatment** by **H**
redn. using **H**-free **gas** contg. water vapor)

IT Reduction
Water vapor
(surface **treatment** by **H** redn. using **H**
-free **gas** contg. water vapor)

IT 7440-44-0, Carbon, processes **7631-86-9**, **Silica**,
processes
(deposited layer; **surface treatment** by

H redn. using **H**-free **gas** contg. water vapor)

IT 7440-21-3, Silicon, processes
(substrate; surface **treatment** by **H** redn. using **H**-free **gas** contg. water vapor)

IT 7732-18-5, Water, uses
(surface **treatment** by **H** redn. using **H** -free **gas** contg. water vapor)

IT 64-17-5, Ethanol, uses 7439-90-9, Krypton, uses 7440-01-9, Neon, uses **7440-37-1**, **Argon**, uses **7440-59-7**, **Helium**, uses 7440-63-3, Xenon, uses 7727-37-9, Nitrogen, uses 7783-54-2, Nitrogen trifluoride 7803-62-5, Silane, uses 10043-92-2, Radon, uses
(surface **treatment** by **H** redn. using **H** -free **gas** contg. water vapor and)

L32 ANSWER 5 OF 6 HCA COPYRIGHT 2001 ACS
ACCESSION NUMBER: 131:145417 HCA
TITLE: Surface-modified polyimide films with improved adhesion
INVENTOR(S): Matsubara, Takeyuki; Uchiyama, Hiroshi
PATENT ASSIGNEE(S): Ube Industries, Ltd., Japan; E. C. Chemical Industry Co., Ltd.
SOURCE: Jpn. Kokai Tokkyo Koho, 6 pp. CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 11209488	A2	19990803	JP 1998-32088	19980128

AB Polyimide films of 20-125 .mu.m thickness and comprising fine particles of an inorg. filler and a polyimide resin which is prepd. from arom. tetracarboxylic acid **component** contg. **3** ,**3**',4,4'-biphenyltetracarboxylic acid, its anhydride, or esters and arom. diamine component including p-phenylenediamine are subjected to **plasma** arc treatment to increase the metal (from the filler) content on one side of the surfaces to 0.03-0.5 atom% and to increase surface oxygen/carbon ratio 0.01-0.20.

IT **7631-86-9**, **Silica**, uses
(filler in films; surface-modified polyimide films with improved adhesion)
RN 7631-86-9 HCA
CN Silica (7CI, 8CI, 9CI) (CA INDEX NAME)

O=Si=O

IT **1333-74-0**, Hydrogen, uses **7440-37-1**, **Argon**

, uses **7440-59-7**, **Helium**, uses
(**plasma**; surface-modified polyimide films with improved adhesion)

RN 1333-74-0 HCA
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H— H

RN 7440-37-1 HCA
CN Argon (8CI, 9CI) (CA INDEX NAME)

Ar

RN 7440-59-7 HCA
CN Helium (7CI, 8CI, 9CI) (CA INDEX NAME)

He

IC ICM C08J007-00
ICS C08J005-18; C08K003-00; C08L079-08
CC 38-3 (Plastics Fabrication and Uses)
ST polyimide film phenylenediamine biphenyltetracarboxylic dianhydride **plasma** treatment; adhesion improvement polyimide film **plasma** treatment
IT **Plasma**
(surface-modified polyimide films with improved adhesion)
IT **7631-86-9**, **Silica**, uses
(filler in films; surface-modified polyimide films with improved adhesion)
IT **1333-74-0**, Hydrogen, uses **7440-37-1**, **Argon**
, uses **7440-59-7**, **Helium**, uses 7727-37-9,
Nitrogen, uses
(**plasma**; surface-modified polyimide films with improved adhesion)

L32 ANSWER 6 OF 6 HCA COPYRIGHT 2001 ACS
ACCESSION NUMBER: 118:245701 HCA
TITLE: Effects of inert **gas** dilution of 1, 3-butadiene on **plasma** deposition of hydrogenated amorphous carbon
AUTHOR(S): Seth, Jayshree; Babu, S. V.
CORPORATE SOURCE: Cent. Adv. Mater. Process., Clarkson Univ., Potsdam, NY, 13699, USA
SOURCE: J. Appl. Phys. (1993), 73(5), 2496-504
CODEN: JAPIAU; ISSN: 0021-8979
DOCUMENT TYPE: Journal

LANGUAGE: English

AB Hydrogenated amorphous carbon films (a-C:H) were deposited by the **plasma** decompn. of mixts. of 1,3-butadiene with different inert gas diluents (**Ar**, Ne, and **He**). Several characteristics of the **plasma** and the deposited films were investigated for deposition gas mixts. ranging in concn. from 0 to 90% of the diluent. Measurement of the optical emission from the **plasma** indicated the presence of the same dominant species from the hydrocarbon source (CH 430 nm system, and hydrogen Balmer lines) for all the mixts. contg. the diluents, although the relative intensities were markedly different. The H*/**H2*** and H*/CH* emission intensity ratios increased with the concn. of butadiene in **argon**- and neon-dild. mixts. while remaining relatively const. in butadiene/**helium plasmas**. Details of some the bonding configurations were detd. from an anal. of the various IR-absorption bands. Film characterization included **etch** rate measurements in an oxygen **plasma** as well as the detn. of the d. and the optical band gap for different deposition gas mixts. All the measurements suggest that when the diluent concn. exceeds .apprx.75% the film structure undergoes a well-defined transition to a predominantly sp2 structure. The relation between the film properties and the deposition gas mixt. and the reactive species present in the **plasma** is discussed.

IT **1333-74-0**, Hydrogen, properties
(**plasma** deposition of amorphous carbon contg., from butadiene dild. with inert gases)

RN 1333-74-0 HCA

CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

IT **7440-37-1**, **Argon**, properties **7440-59-7**, **Helium**, properties
(**plasma** deposition of hydrogenated amorphous carbon from gas mixts. of butadiene and)

RN 7440-37-1 HCA

CN Argon (8CI, 9CI) (CA INDEX NAME)

Ar

RN 7440-59-7 HCA

CN Helium (7CI, 8CI, 9CI) (CA INDEX NAME)

He

CC 76-11 (Electric Phenomena)
ST **plasma** deposition hydrogenated amorphous carbon; **argon** butadiene amorphous carbon **plasma** deposition; neon butadiene amorphous carbon **plasma** deposition; **helium** butadiene amorphous carbon **plasma** deposition; butadiene amorphous carbon **plasma** deposition
IT **Helium**-group gases, properties
(**plasma** deposition of hydrogenated amorphous carbon from gas mixts. of butadiene and)
IT Vapor deposition processes
(**plasma**, of hydrogenated amorphous carbon, from gas mixts. of butadiene and inert gases)
IT **1333-74-0**, Hydrogen, properties
(**plasma** deposition of amorphous carbon contg., from butadiene dild. with inert gases)
IT 7440-01-9, Neon, properties **7440-37-1**, **Argon**, properties **7440-59-7**, **Helium**, properties
(**plasma** deposition of hydrogenated amorphous carbon from gas mixts. of butadiene and)
IT 106-99-0, 1,3-Butadiene, properties
(**plasma** deposition of hydrogenated amorphous carbon from gas mixts. of inert gas and)
IT 7440-44-0, Carbon, properties
(**plasma** deposition of hydrogenated amorphous, from butadiene dild. with inert gases)

=> d l33 1-10 cbib abs hitstr hitind

L33 ANSWER 1 OF 10 HCA COPYRIGHT 2001 ACS
134:347190 **Plasma cleaning** step in a salicide process. Saigal, Dinesh; King, Rochelle; Singhal, Ajay (Applied Materials, Inc., USA). Eur. Pat. Appl. EP 1099776 A1 20010516, 13 pp. DESIGNATED STATES: R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO. (English). CODEN: EPXXDW. APPLICATION: EP 2000-309958 20001109. PRIORITY: US 1999-437573 19991109.
AB Before forming a transition metal silicide in the gate and drain/source regions of a MOS device, the exposed Si regions to be coated and reacted are **plasma cleaned** first. The **plasma gas** consists of **H** or H/ **He** or **He** mixts. with NF3, CF4, SF6, etc.
IT **7440-37-1**, **Argon**, processes **7440-59-7**, **Helium**, processes
(in **plasma cleaning** step in salicide process for MOS device fabrication)
RN 7440-37-1 HCA
CN Argon (8CI, 9CI) (CA INDEX NAME)

Ar

RN 7440-59-7 HCA
CN Helium (7CI, 8CI, 9CI) (CA INDEX NAME)

He

IT **1333-74-0**, **Hydrogen**, **processes**
(in **plasma cleaning** step in salicide process
for MOS device fabrication)
RN 1333-74-0 HCA
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

IT **7631-86-9**, **Silica**, processes
(**plasma cleaning** step in salicide process for
MOS device fabrication)
RN 7631-86-9 HCA
CN Silica (7CI, 8CI, 9CI) (CA INDEX NAME)

O═Si═O

IC ICM C23C014-02
ICS H01L021-306; H01L021-336; H01L021-285; H01L021-3205
CC 76-3 (Electric Phenomena)
ST **plasma cleaning** salicidation; MOS device
fabrication salicidation **plasma cleaning**
IT Hydrocarbons, processes
(fluoro; in **plasma cleaning** step in salicide
process for MOS device fabrication)
IT Sputtering
(metal; in **plasma cleaning** step in salicide
process for MOS device fabrication)
IT **Cleaning**
Dielectric films
MOS devices
Siliconizing
(**plasma cleaning** step in salicide process for
MOS device fabrication)
IT Metals, processes
(**plasma cleaning** step in salicide process for
MOS device fabrication)
IT Noble metals
Refractory metals

(**plasma cleaning** step in salicide process for
MOS device fabrication)
IT Transition metal silicides
(**plasma cleaning** step in salicide process for
MOS device fabrication)
IT Ion implantation
(**plasma cleaning** step in salicide process for
MOS device fabrication using)
IT **Cleaning**
(**plasma**; **plasma cleaning** step in
salicide process for MOS device fabrication)
IT **Etching**
(selective, **silica**; **plasma cleaning**
step in salicide process for MOS device fabrication)
IT **7440-37-1**, **Argon**, processes **7440-59-7**,
Helium, processes
(in **plasma cleaning** step in salicide process
for MOS device fabrication)
IT 75-73-0, Carbon fluoride (CF4) **1333-74-0**, **Hydrogen**
, **processes** 2551-62-4, Sulfur fluoride (SF6)
7783-54-2, Nitrogen fluoride (NF3)
(in **plasma cleaning** step in salicide process
for MOS device fabrication)
IT 7439-98-7, Molybdenum, processes 7440-02-0, Nickel, processes
7440-05-3, Palladium, processes 7440-06-4, Platinum, processes
7440-25-7, Tantalum, processes 7440-32-6, Titanium, processes
7440-33-7, Tungsten, processes 7440-48-4, Cobalt, processes
11101-13-6
(**plasma cleaning** step in salicide process for
MOS device fabrication)
IT 7440-21-3, Silicon, processes
(**plasma cleaning** step in salicide process for
MOS device fabrication)
IT **7631-86-9**, **Silica**, processes
(**plasma cleaning** step in salicide process for
MOS device fabrication)

L33 ANSWER 2 OF 10 HCA COPYRIGHT 2001 ACS
134:187168 Methods of pre-**cleaning** dielectric layers of
substrates in semiconductor device fabrication. Cohen, Barney M.;
Rengarajan, Suraj; Li, Xiangbing; Ngan, Kenny King-tai; Ding, Peijun
(Applied Materials, Inc., USA). Eur. Pat. Appl. EP 1081751 A2
20010307, 21 pp. DESIGNATED STATES: R: AT, BE, CH, DE, DK, ES, FR,
GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO.
(English). CODEN: EPXXDW. APPLICATION: EP 2000-307537 20000901.
PRIORITY: US 1999-388989 19990902; US 1999-388991 19990902.
AB The disclosure relates to a method for improving fill and elec.
performance of metals deposited on patterned dielec. layers.
Apertures such as bias and trenches in the patterned dielec. layer
are **etched** to enhance filling and then **cleaned**
in the same chamber to reduce metal oxides within the aperture. The
patterned dielec. is **cleaned** in a processing chamber (20)

with a 1st **plasma** consisting essentially of **Ar**
(212) wherein the 1st **plasma** is generated by supplying
power to a coil surrounding the processing chamber and supplying
bias to a substrate support member supporting the substrate, the
patterned dielec. layer is **cleaned** in the processing
chamber with a 2nd **plasma** consisting essentially of H and
He (215) wherein the 2nd **plasma** is generated by
increasing the supply of power to the coil surrounding the
processing chamber and reducing the supply of bias to the substrate
support member supporting the substrate, a barrier layer is
deposited on the patterned dielec. layer after exposing the dielec.
layer to the 1st **plasma** and the 2nd **plasma** (220)
and a metal is deposited on the barrier layer (225). Also, the
sequential **plasma** treatments can be practiced in a variety
of **plasma** processing chambers of an integrated process
sequence, including pre-**clean** chambers, phys. vapor
deposition chambers, **etch** chambers, and other
plasma processing chambers. The pre-**clean** process
can also repair damage to the dielec. caused by preceding process
steps, such a O **plasma** ashing processes for removing
photoresist.

IT **7631-86-9**, **Silica**, processes
(carbon doped; pre-**cleaning** dielec. layers of
substrates in semiconductor device fabrication with)

RN 7631-86-9 HCA

CN Silica (7CI, 8CI, 9CI) (CA INDEX NAME)

O═Si═O

IT **1333-74-0**, **Hydrogen**, **processes**
7440-37-1, **Argon**, processes **7440-59-7**,
Helium, processes
(in pre-**cleaning** dielec. layers of substrates in
semiconductor device fabrication)

RN 1333-74-0 HCA

CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

RN 7440-37-1 HCA

CN Argon (8CI, 9CI) (CA INDEX NAME)

Ar

RN 7440-59-7 HCA

CN Helium (7CI, 8CI, 9CI) (CA INDEX NAME)

He

IC ICM H01L021-285
CC 76-3 (Electric Phenomena)
ST **argon** hydrogen **helium plasma**
cleaning dielec film
IT Annealing
Plasma
(in pre-**cleaning** dielec. layers of substrates in semiconductor device fabrication)
IT Oxides (inorganic), processes
(in pre-**cleaning** dielec. layers of substrates in semiconductor device fabrication)
IT **Cleaning**
Dielectric films
Semiconductor device fabrication
(pre-**cleaning** dielec. layers of substrates in semiconductor device fabrication)
IT **Etching**
(pre-**cleaning** dielec. layers of substrates in semiconductor device fabrication using)
IT Metals, processes
(pre-**cleaning** dielec. layers of substrates in semiconductor device fabrication using)
IT Diffusion barrier
(pre-**cleaning** dielec. layers of substrates in semiconductor device fabrication with)
IT Polysiloxanes, processes
(pre-**cleaning** dielec. layers of substrates in semiconductor device fabrication with)
IT **7631-86-9**, **Silica**, processes
(carbon doped; pre-**cleaning** dielec. layers of substrates in semiconductor device fabrication with)
IT **1333-74-0**, **Hydrogen**, **processes**
7440-37-1, **Argon**, processes **7440-59-7**,
Helium, processes
(in pre-**cleaning** dielec. layers of substrates in semiconductor device fabrication)
IT 7440-44-0, Carbon, uses
(**silica** dopant; pre-**cleaning** dielec. layers of substrates in semiconductor device fabrication with)

L33 ANSWER 3 OF 10 HCA COPYRIGHT 2001 ACS
134:124767 In situ **plasma** wafer bonding method for semiconductor and other smooth materials. Farrens, Sharon N.; Roberds, Brian E. (Silicon Genesis Corporation, USA). U.S. US 6180496 B1 20010130, 6 pp. (English). CODEN: USXXAM. APPLICATION: US 1998-143174 19980828. PRIORITY: US 1997-PV57413 19970829.
AB A method is provided for chem. bonding semiconductor wafers and

other materials to each other without exposing wafers to wet environments, and a bonding chamber for in situ **plasma** bonding are disclosed. The in situ **plasma** bonding chamber allows **plasma** activation and bonding to occur without disruption of the vacuum level. This precludes rinsing of the surfaces after placement in the chamber, but allows for variations in ultimate pressure, **plasma** gas species, and backfill gases. The resulting bonded materials are free from macroscopic and microscopic voids. The initial bond is much stronger than conventional bonding techniques, thereby allowing for rougher materials to be bonded to each other. These bonded materials can be used for bond and **etchback** Si on insulator, high voltage and current devices, radiation resistant devices, micromachined sensors and actuators, and hybrid semiconductor applications. This technique is not limited to semiconductors. Any material with sufficiently smooth surfaces that can withstand the vacuum and **plasma** environments may be bonded in this fashion.

IT **7631-86-9**, **Silica**, processes **12033-89-5**, **Silicon nitride**, processes
(In situ **plasma** wafer bonding method for semiconductor and other smooth materials)

RN 7631-86-9 HCA
CN Silica (7CI, 8CI, 9CI) (CA INDEX NAME)

O═Si═O

RN 12033-89-5 HCA
CN Silicon nitride (Si3N4) (8CI, 9CI) (CA INDEX NAME)

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

IT **1333-74-0**, **Hydrogen**, **processes** **7440-37-1**, **Argon**, processes **7440-59-7**, **Helium**, processes
(**plasma** for semiconductor wafer bonding; In situ **plasma** wafer bonding method for semiconductor and other smooth materials)

RN 1333-74-0 HCA
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

RN 7440-37-1 HCA
CN Argon (8CI, 9CI) (CA INDEX NAME)

Ar

RN 7440-59-7 HCA
CN Helium (7CI, 8CI, 9CI) (CA INDEX NAME)

He

IC ICM H01L021-30
ICS H01L021-46
NCL 438455000
CC 76-3 (Electric Phenomena)
ST semiconductor material **plasma** wafer bonding
IT **Cleaning**
Electric insulators
Etching
Microactuators
Microsensors
SOI devices
Semiconductor device fabrication
Semiconductor materials
(In situ **plasma** wafer bonding method for semiconductor and other smooth materials)
IT 1303-00-0, Gallium arsenide, processes 7440-21-3, Silicon, processes **7631-86-9**, **Silica**, processes
12033-89-5, **Silicon nitride**, processes
22398-80-7, Indium phosphide, processes
(In situ **plasma** wafer bonding method for semiconductor and other smooth materials)
IT **1333-74-0**, **Hydrogen**, **processes**
7440-37-1, **Argon**, processes **7440-59-7**,
Helium, processes 7664-41-7, Ammonia, processes
7782-44-7, Oxygen, processes
(**plasma** for semiconductor wafer bonding; In situ **plasma** wafer bonding method for semiconductor and other smooth materials)

L33 ANSWER 4 OF 10 HCA COPYRIGHT 2001 ACS
133:186547 Reactive **plasma etch cleaning** of high aspect ratio openings in semiconductor device fabrication.. Cohen, Barney M.; Su, Jingang; Ngan, Kenny King-tai (Applied Materials, Inc., USA). U.S. US 6110836 A 20000829, 5 pp. (English). CODEN: USXXAM. APPLICATION: US 1999-298065 19990422.
AB Native oxides (e.g., **silicon oxide**) can be removed from a substrate having high aspect ratio openings therein by using a **plasma** gas precursor mixt. of a reactive halogen-contg. gas (e.g., nitrogen trifluoride) and a carrier gas (e.g., **helium**). The lightwt. ions generated in the **plasma** react with oxygen to produce very volatile oxygen-contg. species that can be readily removed through the exhaust system of the **plasma** chamber, preventing re-deposition of oxides on the surface of the substrate or on the sidewalls or bottom of the openings. When the substrate is mounted

in a **plasma** chamber having dual power sources that can form a **plasma** above the substrate and can apply bias to the substrate, tapered openings are formed rapidly that can be readily filled without forming voids.

IT **7440-59-7**, **Helium**, uses
(carrier gas; reactive **plasma etch cleaning** of high aspect ratio openings in semiconductor device fabrication)

RN 7440-59-7 HCA

CN Helium (7CI, 8CI, 9CI) (CA INDEX NAME)

He

IT **1333-74-0**, **Hydrogen**, uses **7440-37-1**, **Argon**, uses
(**gas** mixt. contg.; reactive **plasma etch cleaning** of high aspect ratio openings in semiconductor device fabrication)

RN 1333-74-0 HCA

CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

RN 7440-37-1 HCA

CN Argon (8CI, 9CI) (CA INDEX NAME)

Ar

IT **7631-86-9**, **Silicon oxide**, processes
(native oxide, removal of; reactive **plasma etch cleaning** of high aspect ratio openings in semiconductor device fabrication)

RN 7631-86-9 HCA

CN Silica (7CI, 8CI, 9CI) (CA INDEX NAME)

O═Si═O

IC ICM H01L021-00

NCL 438710000

CC 76-3 (Electric Phenomena)

ST reactive **plasma etch cleaning** opening semiconductor device; RIE **cleaning** high aspect ratio opening

IT Sputtering

(**etching**, reactive; reactive **plasma** **etch** **cleaning** of high aspect ratio openings in semiconductor device fabrication)

IT Oxides (inorganic), processes
(native, removal of; reactive **plasma** **etch** **cleaning** of high aspect ratio openings in semiconductor device fabrication)

IT **Cleaning**
Semiconductor device fabrication
(reactive **plasma** **etch** **cleaning** of high aspect ratio openings in semiconductor device fabrication)

IT **Etching**
(sputter, reactive; reactive **plasma** **etch** **cleaning** of high aspect ratio openings in semiconductor device fabrication)

IT **7440-59-7**, **Helium**, uses
(carrier gas; reactive **plasma** **etch** **cleaning** of high aspect ratio openings in semiconductor device fabrication)

IT **1333-74-0**, **Hydrogen**, uses **7440-37-1**, **Argon**, uses
(**gas** mixt. contg.; reactive **plasma** **etch** **cleaning** of high aspect ratio openings in semiconductor device fabrication)

IT 56-23-5, Carbon tetrachloride, uses 75-73-0, Carbon tetrafluoride 2551-62-4, Sulfur hexafluoride 7783-54-2, Nitrogen trifluoride 10294-34-5, Boron trichloride
(gas mixt. contg.; reactive **plasma** **etch** **cleaning** of high aspect ratio openings in semiconductor device fabrication)

IT **7631-86-9**, **Silicon oxide**, processes
(native oxide, removal of; reactive **plasma** **etch** **cleaning** of high aspect ratio openings in semiconductor device fabrication)

IT 7440-21-3, Silicon, uses
(reactive **plasma** **etch** **cleaning** of high aspect ratio openings in semiconductor device fabrication)

L33 ANSWER 5 OF 10 HCA COPYRIGHT 2001 ACS
129:75171 Dry-**etching** gas for oxide film, its **etching** method, and method of **cleaning** silicon. Saito, Hiroshi (Central Glass Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 10172957 A2 19980626 Heisei, 5 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1996-328847 19961209.

AB An **etching** gas, a mixt. of (1) a HF gas and (2) a gas which is excited and becomes **plasma** (a **plasma** gas), is claimed. The **plasma** gas may be **Ar**, **He**, Kr, Xe, or H. **Cleaning** of Si is carried out by (a) stopping supply of the HF gas after the dry-**etching**, and (b) leading only the **plasma** gas onto the Si substrate. Oxide film is completely removed without damaging Si substrate.

IT **7631-86-9**, **Silicon oxide**, processes
(dry-**etching** gas contg. HF and **plasma** gas for
oxide film)
RN 7631-86-9 HCA
CN Silica (7CI, 8CI, 9CI) (CA INDEX NAME)

O═Si═O

IT **1333-74-0**, **Hydrogen**, uses **7440-37-1**,
Argon, uses **7440-59-7**, **Helium**, uses
(**plasma gas**; dry-**etching** gas contg.
HF and **plasma** gas for oxide film)
RN 1333-74-0 HCA
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H—H

RN 7440-37-1 HCA
CN Argon (8CI, 9CI) (CA INDEX NAME)

Ar

RN 7440-59-7 HCA
CN Helium (7CI, 8CI, 9CI) (CA INDEX NAME)

He

IC ICM H01L021-3065
ICS C23C016-00; C23F004-00; H01L021-304
CC 76-3 (Electric Phenomena)
ST **plasma** gas dry **etching** oxide film; silicon
cleaning dry **etching plasma** gas;
hydrogen fluoride dry **etching** gas
IT **Plasma etching**
(dry-**etching** gas contg. HF and **plasma** gas for
oxide film)
IT Oxides (inorganic), processes
(dry-**etching** gas contg. HF and **plasma** gas for
oxide film)
IT **Cleaning**
(of silicon; dry-**etching** gas contg. HF and
plasma gas for oxide film)
IT 7664-39-3, Hydrogen fluoride, uses
(dry-**etching** gas contg. HF and **plasma** gas for

oxide film)
IT **7631-86-9**, **Silicon oxide**, processes
59763-75-6, Tantalum oxide 82867-87-6, Silicon fluoride oxide (SiFO)
(dry-**etching** gas contg. HF and **plasma** gas for oxide film)
IT 7440-21-3, Silicon, processes
(dry-**etching** gas contg. HF and **plasma** gas for oxide film and **cleaning** of silicon)
IT **1333-74-0**, **Hydrogen**, uses 7439-90-9, Krypton, uses **7440-37-1**, **Argon**, uses **7440-59-7**, **Helium**, uses 7440-63-3, Xenon, uses
(**plasma gas**; dry-**etching** gas contg. HF and **plasma** gas for oxide film)

L33 ANSWER 6 OF 10 HCA COPYRIGHT 2001 ACS
125:290959 Method for **plasma etching** an oxide/polycide structure and manufacture of a semiconductor structure including this method. Costaganna, Pascal; Martinet, Francois (International Business Machines Corp., USA; Ibm France). PCT Int. Appl. WO 9627899 A1 19960912, 25 pp. DESIGNATED STATES: W: JP, KR; RW: AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE. (English). CODEN: PIXXD2. APPLICATION: WO 1996-EP922 19960305. PRIORITY: EP 1995-480015 19950308; EP 1995-480093 19950713.
AB A semiconductor structure including a stack comprised of a cap **SiO2** layer, a WSi2 layer, and a bottom polysilicon layer formed on a Si substrate coated with a thin oxide layer is patterned in a 2-step **plasma** process with a resist stripping/**cleaning** step between them. After a resist mask is formed on the structure, the cap **SiO2** layer is **etched** in a 1st chamber of a multichamber magnetically enhanced reactive ion **etching** reactor using CHF3, O2, and **Ar**. Then, the semiconductor structure is removed from the reactor. The resist mask is eliminated by O2 ashing and the wafer **cleaned** using dil. HF (100:1). Next, the structure is introduced into a 2nd chamber of the RIE reactor, and the WSi2 and polysilicon layers are **etched** in sequence using the patterned cap **SiO2** layer as a hard mask. A mixt. of HCl, Cl2, and N2, preferably with a few ppm of O2, is adequate for WSi2 **etching** and a mixt. of HCl, **He**, and **He**-O2 is adequate for polysilicon **etching**. The thin oxide layer is attacked to a very small extent during this step. Finally, the semiconductor structure is removed from the reaction chamber and is ready for subsequent processing. The improved method is substantially contamination-free and only requires 2 reaction chambers instead of 4. The improved **etching** method finds extensive application in the semiconductor industry and in particular in the formation of the gate conductor stack in 16-Mbit DRAM chips.
IT **7440-37-1**, **Argon**, processes **7440-59-7**, **Helium**, processes
(**plasma etching** of oxide/polycide structures

in gas mixts. contg.)
RN 7440-37-1 HCA
CN Argon (8CI, 9CI) (CA INDEX NAME)

Ar

RN 7440-59-7 HCA
CN Helium (7CI, 8CI, 9CI) (CA INDEX NAME)

He

IC ICM H01L021-321
CC 76-11 (Electric Phenomena)
ST **plasma etching** oxide polycide structure; semiconductor structure oxide polycide **plasma etching**
IT Ashing
(of resist masks after **plasma etching** of oxide/polycide structures)
IT Semiconductor devices
(**plasma etching** of oxide/polycide structures in semiconductor device manuf.)
IT Oxides, processes
Silicides
(**plasma etching** of oxide/polycide structures in semiconductor device manuf.)
IT Sputtering
(**etching**, of oxide/polycide structures in semiconductor device manuf.)
IT Sputtering
(**etching**, reactive, of oxide/polycide structures in semiconductor device manuf.)
IT Memory devices
(random-access, **plasma etching** of oxide/polycide structures in manuf. of)
IT **Etching**
(sputter, of oxide/polycide structures in semiconductor device manuf.)
IT **Etching**
(sputter, reactive, of oxide/polycide structures in semiconductor device manuf.)
IT 7664-39-3, **Hydrogen** fluoride, **processes**
(**cleaning** by; of semiconductor wafers after resist mask ashing)
IT 75-46-7, Fluoroform **7440-37-1**, **Argon**, processes **7440-59-7**, **Helium**, processes 7647-01-0, **Hydrogen** chloride, **processes** 7727-37-9, Nitrogen, processes 7782-44-7, Oxygen, processes 7782-50-5,

Chlorine, processes
(**plasma etching** of oxide/polycide structures in gas mixts. contg.)
IT 12039-88-2, Tungsten disilicide
(**plasma etching** of oxide/polycide structures in semiconductor device manuf.)
IT 7440-21-3, Silicon, processes
(polycryst.; **plasma etching** of oxide/polycide structures in semiconductor device manuf.)

L33 ANSWER 7 OF 10 HCA COPYRIGHT 2001 ACS
125:263275 **Plasma etching** an oxide/polycide structure. Costaganna, Pascal; Martinet, Francois (International Business Machines Corp., USA). Eur. Pat. Appl. EP 731501 A1 19960911, 13 pp. DESIGNATED STATES: R: DE, FR, GB. (English). CODEN: EPXXDW. APPLICATION: EP 1995-480015 19950308.

AB A semiconductor structure including a stack comprised of a cap **SiO2** layer, a W silicide layer, and a bottom polysilicon layer formed on a Si substrate coated with a thin oxide layer is patterned in a 2-step **plasma** process with a resist stripping/**cleaning** step between them. After a resist mask is formed on top of the structure, the cap **SiO2** layer is **etched** as std. in a 1st chamber of a multichamber magnetically enhanced RIE reactor using CHF3, O2, and **Ar**. Then the semiconductor structure is removed from the reactor. The resist mask is eliminated by O2 ashing as std. and the wafer **cleaned** using dil. HF (100:1). Next, the structure is introduced into a 2nd chamber of the RIE reactor, and the WSi2 and polysilicon layers are **etched** in sequence using the patterned cap **SiO2** layer as a hard mask with adequate chemistries. A mixt. of HCl, Cl2, and N2 is adequate for W silicide **etching** and a mixt. of HCl, **He**, and **He** -O2 is adequate for polysilicon **etching**. The thin oxide layer is attacked to a very small extent during this step. Finally, the semiconductor structure is removed from the reaction chamber and is ready for subsequent processing. The improved **etching** method finds extensive application in the semiconductor industry and in particular in the formation of the gate conductor stack in 16-Mbit DRAM chips.

IT **7631-86-9**, **Silica**, processes
(magnetically enhanced RIE of)
RN 7631-86-9 HCA
CN Silica (7CI, 8CI, 9CI) (CA INDEX NAME)

O═Si═O

IT **7440-37-1**, **Argon**, processes **7440-59-7**, **Helium**, processes
(reactive ion **etching** of oxide/polycide structures in gas mixts. contg.)

RN 7440-37-1 HCA
CN Argon (8CI, 9CI) (CA INDEX NAME)

Ar

RN 7440-59-7 HCA
CN Helium (7CI, 8CI, 9CI) (CA INDEX NAME)

He

IC ICM H01L021-321
CC 76-3 (Electric Phenomena)
ST **plasma etching** oxide polycide structure;
reactive ion **etching** oxide polycide structure; tungsten
silicide reactive ion **etching**; **silica** reactive
ion **etching**; polysilicon reactive ion **etching**
IT **Cleaning**
(in **plasma etching** of oxide/polycide
structures)
IT Ashing
(of resist masks after reactive ion **etching** of
oxide/polycide structures)
IT Oxides, processes
Silicides
(**plasma etching** oxide/polycide structures)
IT Semiconductor devices
(**plasma etching** oxide/polycide structures in)
IT Sputtering
(**etching**, of oxide/polycide structures)
IT Sputtering
(**etching**, reactive, magnetically enhanced; of
oxide/polycide structures)
IT Memory devices
(random-access, reactive ion **etching** of oxide/polycide
structures in)
IT **Etching**
(sputter, of oxide/polycide structures)
IT **Etching**
(sputter, reactive, magnetically enhanced; of oxide/polycide
structures)
IT 7664-39-3, **Hydrogen** fluoride, **processes**
(**cleaning** by; of semiconductor wafers after reactive
ion **etching** of oxide/polycide structures)
IT **7631-86-9**, **Silica**, processes 12039-79-1,
Tantalum silicide (TaSi2) 12039-83-7, Titanium silicide (TiSi2)
12039-88-2, Tungsten silicide 12039-90-6, Zirconium silicide
(ZrSi2) 12136-78-6, Molybdenum silicide (MoSi2)
(magnetically enhanced RIE of)

IT 7440-21-3, Silicon, processes
(polycryst.; **plasma etching** oxide/polycide
structures)
IT 75-46-7, Fluoroform
(reactive ion **etching** of oxide/polycide structures in)
IT **7440-37-1**, **Argon**, processes **7440-59-7**,
Helium, processes 7647-01-0, **Hydrogen** chloride,
processes 7727-37-9, Nitrogen, processes 7782-44-7,
Oxygen, processes 7782-50-5, Chlorine, processes
(reactive ion **etching** of oxide/polycide structures in
gas mixts. contg.)

L33 ANSWER 8 OF 10 HCA COPYRIGHT 2001 ACS
124:304796 Induction **plasma** CVD or **etching** and
apparatus for same. Hata, Jiro; Hama, Kiichi; Ppongo, Toshiaki
(Tokyo Electron Ltd, Japan). Jpn. Kokai Tokkyo Koho JP 07312348 A2
19951128 Heisei, 12 pp. (Japanese). CODEN: JKXXAF. APPLICATION:
JP 1994-329329 19941201. PRIORITY: JP 1994-76727 19940323.
AB The CVD or **etching** is achieved in a sealed vessel in which
.gtoreq.1 part of the wall surface comprises a dielec. substance by
applying a high frequency voltage to a dielec. means disposed at the
outside of the dielec. substance wall surface to form a
plasma of film-forming or **etching** gas(es) supplied
from a supplying means for film deposition on a substrate or for
etching a substrate; a nonfilm-forming gas(es) is supplied
between the dielec. substance inside surface and film-forming
gas-supplying means. The app. is also claimed.
IT **12033-89-5**, **Silicon nitride**, processes
(amorphous; **plasma** CVD app. with **plasma
cleaning** means for deposition of)
RN 12033-89-5 HCA
CN Silicon nitride (Si3N4) (8CI, 9CI) (CA INDEX NAME)

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***
IT **7631-86-9**, **Silicon dioxide**, processes
(**plasma** CVD app. with **plasma cleaning**
means for deposition of)
RN 7631-86-9 HCA
CN Silica (7CI, 8CI, 9CI) (CA INDEX NAME)

O=Si=O

IT **1333-74-0**, **Hydrogen**, **processes**
7440-37-1, **Argon**, processes **7440-59-7**,
Helium, processes
(**plasma**; for **cleaning** inside vessel wall
dielec. substance surfaces of **plasma** CVD or
etching app.)
RN 1333-74-0 HCA
CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H- H

RN 7440-37-1 HCA
CN Argon (8CI, 9CI) (CA INDEX NAME)

Ar

RN 7440-59-7 HCA
CN Helium (7CI, 8CI, 9CI) (CA INDEX NAME)

He

IC ICM H01L021-205
ICS H01L021-31; H05H001-46
CC 76-11 (Electric Phenomena)
ST **plasma** CVD **etching** nonfilm forming gas
IT Sputtering
(**etching**, with **plasma cleaning** means using nonfilm-forming gases)
IT Vapor deposition processes
(**plasma**, with **plasma cleaning** means using nonfilm-forming gases)
IT **Etching**
(sputter, with **plasma cleaning** means using nonfilm-forming gases)
IT 7440-21-3, Silicon, processes **12033-89-5**, **Silicon nitride**, processes
(amorphous; **plasma** CVD app. with **plasma cleaning** means for deposition of)
IT 7782-50-5, Chlorine, processes 10294-34-5, Boron chloride (BCl3)
(**etchant**; **plasma etching** of aluminum substrate using)
IT 2551-62-4, Sulfur hexafluoride
(**etchant**; **plasma etching** of amorphous silicon or **silicon nitride** substrate using)
IT 75-73-0, Carbon tetrafluoride
(**etchant**; **plasma etching** of amorphous silicon substrate using)
IT **7631-86-9**, **Silicon dioxide**, processes
(**plasma** CVD app. with **plasma cleaning** means for deposition of)
IT 7429-90-5, Aluminum, processes
(**plasma etching** of aluminum substrate using chlorine and boron chloride **plasmas**)

IT **1333-74-0**, **Hydrogen**, **processes**
7440-37-1, **Argon**, processes **7440-59-7**,
Helium, processes 7727-37-9, Nitrogen, processes
7782-44-7, Oxygen, processes
(**plasma**; for **cleaning** inside vessel wall
dielec. substance surfaces of **plasma** CVD or
etching app.)

L33 ANSWER 9 OF 10 HCA COPYRIGHT 2001 ACS
115:245143 Detrimental effects of low-pressure electron cyclotron
resonance **plasmas**: impact on dry **etching** and
dry **cleaning**. Ditizio, R. A.; Hallett, W. L.; Fonash, S.
J. (Cent. Electron. Mater. Process., Pennsylvania State Univ.,
University Park, PA, 16802, USA). Proc. - Electrochem. Soc.,
91-9(Defects Silicon 2), 493-500 (English) 1991. CODEN: PESODO.
ISSN: 0161-6374.

AB The effect were studied that low-pressure ECR **plasma**
exposures can have on the integrity of thermally grown
silicon dioxide. By using gas species which are
typically found in a variety of dry **etch** and dry
cleaning process chemistries, the repercussions were studied
that may occur in ECR **plasma**-based processing of high
quality oxides. After short exposure times, on the order of several
minutes, significant shifts in the C-V characteristics occur in MOS
structures fabricated on these exposed oxides.

IT **7631-86-9**, **Silica**, uses and miscellaneous
(**cleaning** and **etching** of, in ECR
plasmas, detrimental effects during)

RN 7631-86-9 HCA

CN Silica (7CI, 8CI, 9CI) (CA INDEX NAME)

O=Si=O

IT **1333-74-0**, Hydrogen, uses and miscellaneous
7440-37-1, **Argon**, uses and miscellaneous
7440-59-7, **Helium**, uses and miscellaneous
(**plasma cleaning** and **etching** of
silica by)

RN 1333-74-0 HCA

CN Hydrogen (8CI, 9CI) (CA INDEX NAME)

H-H

RN 7440-37-1 HCA

CN Argon (8CI, 9CI) (CA INDEX NAME)

Ar

RN 7440-59-7 HCA
CN Helium (7CI, 8CI, 9CI) (CA INDEX NAME)

He

CC 76-3 (Electric Phenomena)
Section cross-reference(s): 66
ST cyclotron resonance **plasma etching cleaning**; **silica plasma etching cleaning**; device **silica plasma etching cleaning**
IT **Plasma**, chemical and physical effects
(**cleaning** of **silica** by)
IT Semiconductor devices
(from **plasma** cyclotron resonant processing of **silica**)
IT Cyclotron resonance
(in **plasma etching** of silicon)
IT Sputtering
(**etching**, of **silica**, detrimental effects during)
IT **Etching**
(sputter, of **silica**, detrimental effects during)
IT **7631-86-9**, **Silica**, uses and miscellaneous
(**cleaning** and **etching** of, in ECR **plasmas**, detrimental effects during)
IT **1333-74-0**, Hydrogen, uses and miscellaneous
7440-37-1, **Argon**, uses and miscellaneous
7440-59-7, **Helium**, uses and miscellaneous
7782-44-7, Oxygen, uses and miscellaneous
(**plasma cleaning** and **etching** of **silica** by)

L33 ANSWER 10 OF 10 HCA COPYRIGHT 2001 ACS
115:103055 Growth and characterization of undoped and in situ doped silicon-germanium on patterned oxide silicon substrates by very low pressure chemical vapor deposition at 700 and 625.degree.C. Tsai, Curtis; Jang, Syun Ming; Tsai, Julie; Reif, Rafael (Dep. Electr. Eng. Comput. Sci., Massachusetts Inst. Technol., Cambridge, MA, 02139, USA). J. Appl. Phys., 69(12), 8158-63 (English) 1991. CODEN: JAPIAU. ISSN: 0021-8979.
AB Results of strained layer Si1-xGex heteroepitaxy on patterned oxide Si substrates using a very low pressure chem. vapor deposition reactor are presented. Patterned oxide wafers were in situ **cleaned** at 700.degree. using an **Ar/H2 plasma**. Undoped Si1-xGex strained layers at 625 and

700.degree. along with in situ doped p and n-type Si1-xGex strained layers at 625.degree. were deposited using SiH4, GeH4, B2H6, and AsH2 with **H2** as a carrier gas. Alternating layers of Si1-xGex and Si were formed by switching the inlet gases. SEM showed a smooth surface morphol. for Si1-xGex strained layers deposited with GeH4/SiH4 gas ratios <7.5%. Cross-sectional TEM revealed a sharp transition between the Si1-xGex and Si layers with dislocation densities below the detection limit of 105 cm-2. Defect **etching** confirmed the low defect d. at the surface. For epitaxial windows smaller than 50 .times. 50 .mu.m, no defects were obsd. Ge solid mole fraction, B and As chem. dopant concns., and interfacial C and O contamination were measured by SIMS. Undoped, B2H6, and AsH3 in situ doped Si1-xGex strain layers with Ge content up to 23% were demonstrated. The Ge incorporation was controlled by the GeH4/SiH4 gas ratio and the Si1-xGex growth rate decreased with increasing Ge solid mole fraction. The addn. of B2H6 did not affect the Si1-xGex growth rate and modulation of **he** boron chem. incorporation was possible by controlling the B2H6 gas concn. On the other hand, AsH3 severely degraded the Si1-xGex growth rate and varying the AsH3 gas concn. did not change the arsenic chem. incorporation. Selective AsH3 doped Si1-xGex heteroepitaxy was obsd.

CC 75-1 (Crystallography and Liquid Crystals)
Section cross-reference(s): 76

IT 11126-22-0, **Silicon oxide**
(epitaxial growth of germanium silicon on patterned surface of)

IT 37380-03-3 135698-96-3 135698-97-4
(epitaxial growth of, on patterned **silicon oxide** substrate)

=> d l34 1-11 cbib abs hitind

L34 ANSWER 1 OF 11 HCA COPYRIGHT 2001 ACS

135:101183 **Plasma** surface treatment method and **plasma** device for removing photoresist materials. Takamatsu, Toshi; Fujimura, Shuzo (Japan). U.S. Pat. Appl. Publ. US 20010008803 A1 20010719, 13 pp. (English). CODEN: USXXCO. APPLICATION: US 1999-268203 19990315. PRIORITY: US 1998-PV78321 19980317.

AB The present invention provides a method for treating a surface of an object using, for example, a downstream region of a **plasma** source. The method includes a step of generating a **plasma** from a gas-C in a **plasma** source, where the gas-C includes a gas-A and a gas-B. Gas-A is selected from a compd. comprising at least a N bearing compd. or an other gas. The other gas is selected from a mixt. of an element in Group 18 classified in the at. periodic table. Gas-B includes at least a NH3 bearing compd. The method also includes a step of injecting a gas-D downstream of the **plasma** source of the gas-C. The method also includes a step of setting an object (having a surface) downstream of the gas-D injection and downstream of the **plasma** source. A step of

processing the surface of the object by a mixt. species generated from the gas-C in the **plasma** and the gas-D is included.
The NH_3 bearing compd. in the gas-C includes a NH_3 bearing concn. that is lower than an explosion limit of NH_3, which is safer than conventional techniques.

IC ICM C23F001-02
ICS H01L021-302
NCL 438706000
CC 76-11 (Electric Phenomena)
ST **plasma** device nitrogen compd noble gas photoresist; safety **plasma** treatment
IT Electric discharge devices
Photoresists
Plasma
(**plasma** surface treatment method and **plasma** device for removing photoresist materials)
IT Alcohols, processes
Noble gases, processes
(**plasma** surface treatment method and **plasma** device for removing photoresist materials)
IT 64-17-5, Ethanol, processes 7439-90-9, Krypton, processes 7440-01-9, Neon, processes **7440-37-1, Argon**, processes **7440-59-7, Helium**, processes 7440-63-3, Xenon, processes 7664-41-7, Ammonia, processes 7664-41-7D, Ammonia, derivs. 7727-37-9, Nitrogen, processes 7727-37-9D, Nitrogen, compds. 7732-18-5, Water, processes 7783-54-2, Nitrogen fluoride (NF_3) 7803-62-5, Silane, processes 10043-92-2, Radon, processes 12385-13-6, Atomic **hydrogen, processes**
(**plasma** surface treatment method and **plasma** device for removing photoresist materials)
IT 7440-21-3, Silicon, processes **7631-86-9, Silica**, processes
(**plasma surface** treatment method and **plasma** device for removing photoresist materials)

L34 ANSWER 2 OF 11 HCA
134:171254 The effects of **plasma** treatment on SiO_2 aerogel film using various reactive (O_2, **H_2**, N_2) and non-reactive (**He**, **Ar**) gases. Kim, J.-J.; Park, H.-H.; Hyun, S.-H. (Department of Ceramic Engineering, Yonsei University, Seodaemun-ku, Seoul, 120-749, S. Korea). Thin Solid Films, 377-378, 525-529 (English) 2000. CODEN: THSFAP. ISSN: 0040-6090. Publisher: Elsevier Science S.A..
AB To reduce the R-C time delay of ULSI circuits, interconnection materials with low resistance and/or interlayer films with low dielec. const. should be applied. A SiO_2 aerogel film processed by spin-coating and supercrit. drying has high porosity and large integral surface area. Therefore, this material can offer a low dielec. const. Various gas **plasma** treatments can control the internal **surface** chem. species of **SiO_2** aerogel film, such as org. groups, hydroxyl groups, and adsorbed

water. Through O2, N2, **He**, and **Ar**
plasma treatments, condensation reaction between -OR and -OH groups happened and this induced the redn. of film thickness. After the treatments, -OH related bonds were formed due to adsorbed moisture. Therefore, the dielec. const. and the leakage current increased. However, the amelioration of elec. properties could be obtained after subsequent thermal treatment. On the contrary, a **H2 plasma** treated SiO2 aerogel film showed better leakage current behavior than that of the thermally treated one. This was due to the hydrophobic character of the **H2 plasma** treated sample. The **H2 plasma** was seemed to passivate porous SiO2 aerogel film with hydrogen. Then **H2 plasma** treatment was revealed as one possible post-treatment of the SiO2 aerogel film for applying to an intermetal dielec. in a multilevel interconnection structure.

CC 76-2 (Electric Phenomena)

ST **plasma** treatment silica aerogel dielec interlayer ULSI interconnect

IT Integrated circuits
(ULSI; effects of **plasma** treatment on SiO2 aerogel film for dielec. interlayer in ULSI interconnect using various reactive and non-reactive gases)

IT Aerogels
Dielectric constant
Electric insulators
Interconnections (electric)
Leakage current
Semiconductor device fabrication
Semiconductor devices
Surface area
(effects of **plasma** treatment on SiO2 aerogel film for dielec. interlayer in ULSI interconnect using various reactive and non-reactive gases)

IT Coating process
(spin; effects of **plasma** treatment on SiO2 aerogel film for dielec. interlayer in ULSI interconnect using various reactive and non-reactive gases)

IT 7631-86-9P, Silica, uses
(effects of **plasma** treatment on SiO2 aerogel film for dielec. interlayer in ULSI interconnect using various reactive and non-reactive gases)

IT **1333-74-0**, Hydrogen, reactions **7440-37-1**, **Argon**, reactions **7440-59-7**, **Helium**, reactions 7727-37-9, Nitrogen, reactions 7782-44-7, Oxygen, reactions
(effects of **plasma** treatment on SiO2 aerogel film for dielec. interlayer in ULSI interconnect using various reactive and non-reactive gases)

L34 ANSWER 3 OF 11 HCA COPYRIGHT 2001 ACS

133:67409 Manufacture of bottom electrode of DRAM electric capacitor.
You, Cui Rong; Fuang, Guo Tai; Lu, Huo Tie (Lien Hua Electronics

Co., Ltd., Taiwan). Jpn. Kokai Tokkyo Koho JP 2000174231 A2 20000623, 6 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1998-348252 19981208.

AB The method comprises forming a dielec. substance layer (e.g., **SiO2**) on a **substrate**, forming openings for the node contact point, vapor depositing doped Si in the openings to form an node contact points, forming a B2H6-, PH3-, or AsH3-doped amorphous Si layer on the dielec. substance layer and the node contact points by **plasma**-enhanced CVD, and patterning the amorphous Si layer to form the bottom electrode.

IC ICM H01L027-108
ICS H01L021-8242; H01L021-285; H01L027-04; H01L021-822

CC 76-10 (Electric Phenomena)

IT Vapor deposition process
(**plasma**; manuf. of bottom electrode of DRAM elec. capacitor by patterning doped amorphous silicon layer formed by)

IT **1333-74-0**, **Hydrogen**, uses **7440-37-1**, **Argon**, uses **7440-59-7**, **Helium**, uses
(carrier **gas**; manuf. of bottom electrode of DRAM elec. capacitor by patterning doped amorphous silicon layer formed by **plasma** CVD)

L34 ANSWER 4 OF 11 HCA COPYRIGHT 2001 ACS

133:62600 Synthesis of crystalline carbon nitride film by microwave **plasma** chemical vapor deposition. Tian, Zhongzhuo; Yuan, Lei; Gu, Yousong; Duan, Zhenjun; Chang, Xiangrong; Zhao, Minxue (Institute of Physics, Chinese Academy of Sciences, Peop. Rep. China). Faming Zhuanli Shenqing Gongkai Shuomingshu CN 1219604 A 19990616, 15 pp. (Chinese). CODEN: CNXXEV. APPLICATION: CN 1997-121868 19971211.

AB The process comprises: pretreating **substrate** (Si, **SiO2**, Pt, Ta, Mo, Ni, etc.) by chem. cleaning and polishing, placing the substrate onto quartz support, placing the support in quartz tube, sealing, vacuumizing, introducing working gas into quartz tube, adjusting pressure in the quartz tube to 15-30 torr, opening microwave source to ionize the working gas to produce **plasma**, and depositing C3N4 film onto the substrate, where the working gas contains C-contg. gas at flow rate 0.2-5 cm3/min and N-contg. gas at flow rate 20-100 cm3/min; and the substrate temp. is 700-950.degree.. Preferably, Pt substrate is annealed in inert gas at 800-1000.degree. for 10-30 min before deposition; Si substrate is pre-treated by ultrasound in deionized water contg. 0.5-1 .mu.m diamond powder; the C-contg. gas includes CH4, CO, and C2H2; the N-contg. gas includes N2 and NH3; and auxiliary **gas** (**Ar**, **H**, or **He**) is used with working gas at flow rate 0-80 cm3/min. The app. used in the synthesis consists of microwave system, gas supplying system, vacuum system, and temp. measurement system.

IC ICM C23C016-36

CC 57-8 (Ceramics)
Section cross-reference(s): 47, 76

ST carbon nitride cryst film microwave **plasma** CVD

IT Vapor deposition process
(**plasma**; synthesis of cryst. carbon nitride film by
microwave **plasma** chem. vapor deposition)
IT Films
Microwave
(synthesis of cryst. carbon nitride film by microwave
plasma chem. vapor deposition)
IT 7439-98-7, Molybdenum, processes 7440-02-0, Nickel, processes
7440-06-4, Platinum, processes 7440-21-3, Silicon, processes
7440-25-7, Tantalum, processes **7631-86-9**, **Silica**
, processes
(**substrate**; for synthesis of cryst. carbon nitride film
by microwave **plasma** chem. vapor deposition)
IT 154769-61-6, Carbon nitride
(synthesis of cryst. carbon nitride film by microwave
plasma chem. vapor deposition)
IT 74-82-8, Methane, processes 74-86-2, Acetylene, processes
630-08-0, Carbon monoxide, processes 7664-41-7, Ammonia, processes
7727-37-9, Nitrogen, processes
(working gas contg.; for synthesis of cryst. carbon nitride film
by microwave **plasma** chem. vapor deposition)

L34 ANSWER 5 OF 11 HCA COPYRIGHT 2001 ACS
123:235949 Manufacture of silica protective film by **plasma**
chemical vapor deposition. Ito, Kazuyuki; Nakamura, Kyuzo;
Ishikawa, Michio; Togawa, Atsushi; Tani, Noriaki; Hashimoto,
Yukinori; Oohashi, Yumiko (Ulvac Corp, Japan; Brother Ind Ltd).
Jpn. Kokai Tokkyo Koho JP 07187644 A2 19950725 Heisei, 7 pp.
(Japanese). CODEN: JKXXAF. APPLICATION: JP 1993-335714 19931228.
AB The SiO2 protective film is manufd. by **plasma** chem. vapor
depositing using org. oxysilanes and **Ar**, **He**, or
NH3 as decompn. aids to prevent ashing by O radicals. Ashing of a
substrate was prevented.
IC ICM C01B033-12
ICS C08J007-06; G11B005-72; G11B005-84; G11B007-26
CC 57-2 (Ceramics)
ST **plasma** CVD silica protective film; **argon**
plasma CVD silica film; **helium plasma**
CVD silica film; ammonia **plasma** CVD silica film
IT Vapor deposition processes
(**plasma** CVD of silica protective film for prevention of
ashing by oxygen **plasma**)
IT Acrylic polymers, miscellaneous
Epoxy resins, miscellaneous
Polycarbonates, miscellaneous
(**substrates**; **plasma** CVD of **silica**
protective film for prevention of ashing by oxygen **plasma**
)
IT 7631-86-9P, Silica, preparation
(**plasma** CVD of silica protective film for prevention of
ashing by oxygen **plasma**)
IT 75-73-0, Tetrafluoromethane **1333-74-0**, **Hydrogen**,

processes 7440-37-1, **Argon**, processes
7440-59-7, **Helium**, processes 7664-41-7, Ammonia,
processes 7782-44-7, Oxygen, processes 7783-54-2, Nitrogen
trifluoride 10024-97-2, Nitrogen oxide (N2O), processes
(**plasma** CVD of silica protective film for prevention of
ashing by oxygen **plasma**)

IT 78-10-4, Tetraethoxysilane 681-84-5, Tetramethoxysilane
(**plasma** CVD of silica protective film for prevention of
ashing by oxygen **plasma**)

L34 ANSWER 6 OF 11 HCA COPYRIGHT 2001 ACS
122:328515 Treatment of foreign material on a surface. Elliott, David
J.; Hollman, Richard F.; Yans, Francis M.; Singer, Daniel K. (Uvtech
Systems, Inc., USA). PCT Int. Appl. WO 9507152 A1 19950316, 99 pp.
DESIGNATED STATES: W: AM, AT, AU, BB, BG, BR, BY, CA, CH, CN, CZ,
DE, DK, ES, FI, GB, GE, HU, JP, KE, KG, KP, KR, KZ, LK, LT, LU, LV,
MD, MG, MN, MW, NL, NO, NZ, PL, PT, RO, RU, SD, SE, SI, SK, TJ, TT,
UA, US, UZ, VN; RW: AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU,
MC, NL, PT, SE. (English). CODEN: PIXXD2. APPLICATION: WO
1994-US9996 19940902. PRIORITY: US 1993-118806 19930908; US
1994-298023 19940829.

AB Foreign material on a surface of a substrate, esp. a semiconductor
wafer or magnetic recording head, is processed to form a reaction
product, by the combination of providing a directed flow of a fluid,
including a reactant, in the vicinity of the foreign material, and
delivering a beam of radiation to aid the reactant to react with the
foreign material to form the reaction product.

IC ICM B08B003-00
ICS B08B005-00; B08B005-04; B08B007-00; B44C001-22; C23F001-00

CC 76-3 (Electric Phenomena)
Section cross-reference(s): 77

IT **Plasma**
Sound and Ultrasound
(treatment of foreign material on surfaces by)

IT **1333-74-0**, **Hydrogen**, **processes**
7440-37-1, **Argon**, processes **7440-59-7**,
Helium, processes 7664-41-7, Ammonia, processes
7727-37-9, Nitrogen, processes 10024-97-2, Nitrogen oxide (N2O),
processes
(**treatment** of foreign material on a surface by fluids
contg.)

IT 7440-21-3, Silicon, processes 7631-86-9, **Silica**,
processes
(treatment of **surfaces** contaminated with)

L34 ANSWER 7 OF 11 HCA COPYRIGHT 2001 ACS
121:48380 Process and etchant system for **plasma** etching a
multilayer substrate. Cathey, David A. (Micron Technology, Inc.,
USA). U.S. US 5314578 A 19940524, 5 pp. (English). CODEN:
USXXAM. APPLICATION: US 1992-904463 19920625.

AB A C-contg., chem.-etchant-protective, patterned layer is formed on a
multilayer **substrate** including a **SiO2** layer

formed on an underlying Si or metal silicide layer by providing a predetd. pattern defining a plurality of openings in the C-contg. layer. Next, the exposed areas of the major **surface** of the **SiO2** structural layer are selectively etched with a substantially C-free chem. etchant system comprising a halogen-contg. material and a H-contg. material. These materials form a polyhalocarbon material in the presence of a C-contg. material. Thus, since the chem.-etchant-protective patterned layer is C-contg., a localized polyhalocarbon deposition can be affected, at high selectivity conditions, by adding the C-free chem. etchant system in the presence of the protective patterned layer. More specifically, the H-contg. material reacts with the C-free, halogen-contg. material and the C-contg. patterned layer to selectively form in situ a polyhalocarbon protective coating on the SiO2 structural layer.

IC ICM H01L021-00
NCL 156662000
CC 76-3 (Electric Phenomena)
ST **plasma** etching multilayer substrate; silica layer **plasma** etching; halogen hydrogen contg etchant multilayer substrate
IT **1333-74-0**, Hydrogen, uses 2551-62-4, Sulfur fluoride (SF6) 7439-90-9, Krypton, uses 7440-01-9, Neon, uses **7440-37-1**, **Argon**, uses **7440-59-7**, **Helium**, uses 7440-63-3, Xenon, uses 7664-39-3, Hydrogen fluoride, uses 7664-41-7, Ammonia, uses 7727-37-9, Nitrogen, uses 7782-41-4, Fluorine, uses 7783-54-2, Nitrogen fluoride (NF3)
(etchant contg., for **plasma** etching of multilayer substrates)
IT 7631-86-9, Silica, reactions
(**plasma** etching of multilayer substrates contg.)

L34 ANSWER 8 OF 11 HCA COPYRIGHT 2001 ACS
117:75105 Polycrystalline diamond tools and their manufacture. Tanabe, Keiichiro; Fujimori, Naoji (Sumitomo Electric Industries, Ltd., Japan). Eur. Pat. Appl. EP 487292 A1 19920527, 28 pp. DESIGNATED STATES: R: DE, ES, FR, GB, NL, SE. (English). CODEN: EPXXDW. APPLICATION: EP 1991-310636 19911119. PRIORITY: JP 1990-319210 19901122.
AB Polycryst. diamond having impurity concn. changes in the thickness is used in the manuf. of cutting tools or abrasion-resistance tools. The concn. of impurity in the diamond is lower at the rake surface than that at the fixation surface. C-contg. gas, e.g., CH4, **H gas**, and powder of impurity, e.g., WF6, are introduced into a vacuum chamber and the material gas is excited by **plasma** or radicals and deposited on the heated substrate, e.g., W, along with the powder impurity. The deposition process is repeated with increasing the ratio of impurity in the material gas until the diamond becomes >40 .mu.m in thickness. Owing to the higher impurity concn. of diamond near the fixation surface, the diamond tool excels in chip resistance or toughness.
IC ICM C23C016-00

ICS C23C016-26
CC 57-8 (Ceramics)
IT Halogens
Helium-group gases, uses
(in manuf. of polycryst. diamond having nonuniform impurity concn. in thickness direction, for cutting tools)
IT **1333-74-0**, Hydrogen, uses **7440-37-1**, **Argon**, uses **7440-59-7**, **Helium**, uses 7727-37-9, Nitrogen, uses 7782-41-4, Fluorine, uses
(in manuf. of polycryst. diamond having nonuniform impurity concn. in thickness direction, for cutting tools)
IT 1344-28-1, Alumina, uses 7440-32-6, Titanium, uses **7631-86-9**, **Silica**, uses 10043-11-5, Boron nitride (BN), uses **12033-89-5**, **Silicon nitride**, uses 12069-32-8, Boron carbide (B4C) 12069-89-5, Molybdenum carbide (Mo2C) 12070-06-3, Tantalum carbide (TaC) 12070-08-5, Titanium carbide (TiC) 12070-12-1, Tungsten carbide (WC) 12070-13-2, Tungsten carbide (W2C) 24304-00-5, Aluminum nitride 25583-20-4, Titanium nitride (TiN)
(**substrate**, in manuf. of polycryst. diamond having nonuniform impurity concn. in thickness direction, for cutting tools)

L34 ANSWER 9 OF 11 HCA COPYRIGHT 2001 ACS
112:82895 Method for etching silicon nitride films. Loewenstein, Lee M. (Texas Instruments Inc., USA). U.S. US 4857140 A 19890815, 9 pp. Cont.-in-part of U.S. Ser. No. 73,937, abandoned. (English). CODEN: USXXAM. APPLICATION: US 1988-175474 19880331. PRIORITY: US 1987-73937 19870716; US 1987-75017 19870716.
AB The title process comprises (a) placing the films in a low-pressure chamber, (b) generating free radicals from a F-contg. gas, e.g., CF4, F2, SF6, CFH3, or C2F6, and an inert carrier selected from **He**, **Ar**, and N in a **plasma** generator remote from the process chamber, and (c) introducing the **gas**, and a **H** source selected from CH4, **H2**, NH3, hydrocarbons, and any abstractable H atoms into the low-pressure chamber contg. the films. This method minimizes surface damage, and is esp. suitable for the etching of **Si nitride** on semiconductor **wafers**.
IC ICM B44C001-22
ICS C03C015-00; C03C025-06
NCL 156643000
CC 57-2 (Ceramics)
Section cross-reference(s): 76
ST silicon nitride film etching semiconductor; radical **plasma** hydrogen etching; inert gas carrier **plasma**; **helium** carrier **plasma**; **argon** carrier **plasma**; nitrogen carrier **plasma**; nitrogen trifluoride radical; carbon tetrafluoride radical; fluorine radical; sulfur hexafluoride radical; hexafluoroethane radical; tetrafluoromethane radical; trifluoromethane radical; methane hydrogen; ammonia hydrogen; hydrocarbon hydrogen

IT **Helium**-group gases, uses and miscellaneous
(carrier gas, in **plasma** etching of silicon nitride films on semiconductors, for minimized surface damage)
IT Hydrocarbons, uses and miscellaneous
(hydrogen source, **plasma** contg., etching with, of silicon nitride films on semiconductors, for minimized surface damage)
IT Semiconductor materials
(silicon nitride films on, **plasma** etching of, with free radicals in presence of hydrogen, for minimized surface damage)
IT **7440-37-1**, **Argon**, uses and miscellaneous
7440-59-7, **Helium**, uses and miscellaneous
7727-37-9, Nitrogen, uses and miscellaneous
(carrier gas, in **plasma** etching of silicon nitride films on semiconductors, for minimized surface damage)
IT 75-46-7D, Trifluoromethane, radicals 75-73-0D, Carbon tetrafluoride, radicals 76-16-4D, Hexafluoroethane, radicals 2551-62-4D, Sulfur hexafluoride, radicals
(etching with, **plasma**, in presence of hydrogen, of silicon nitride films on semiconductors, for minimized surface damage)
IT 7782-41-4D, Fluorine, radicals, reactions 7783-54-2D, Nitrogen trifluoride, radicals
(etching with, **plasma**, in presence of hydrogen, of silicon nitride films on semiconductors, for minimized surface damage)
IT 12033-89-5, Silicon nitride, uses and miscellaneous
(films, **plasma** etching of, on semiconductors, with free radicals in presence of hydrogen, for minimized surface damage)
IT 74-82-8, Methane, uses and miscellaneous 7664-41-7, Ammonia, uses and miscellaneous
(hydrogen source, **plasma** contg., etching with, of silicon nitride films on semiconductors, for minimized surface damage)
IT **1333-74-0**, Hydrogen, uses and miscellaneous
(**plasma** contg., etching with, of silicon nitride films on semiconductors, for minimized surface damage)

L34 ANSWER 10 OF 11 HCA COPYRIGHT 2001 ACS
101:162394 Magnetic and crystalline properties of ion-implanted garnet films with **plasma** exposure. Betsui, K.; Miyashita, T.; Komenou, K. (Fujitsu Lab., Atsugi, 243-01, Japan). IEEE Trans. Magn., MAG-20(5 Pt. 1), 1117-19 (English) 1984. CODEN: IEMGAQ. ISSN: 0018-9464.
AB The implantation-induced anisotropy field change, .DELTA.Hk, and lattice strain, .DELTA.d/d, in ion implanted films were enhanced considerably by exposing films to **plasma** of **H2**, **He**, Ne and **Ar** gases at a substrate temp. >100.degree.. The enhanced .DELTA.Hk is twice as large as the as-implanted value in typical expts., and it is comparable to the .DELTA.Hk of the H ion implanted layer. The enhanced .DELTA.Hk of the exposed film decreases greatly with increasing annealing temp.,

but this can be prevented by coating the **surface** with a **SiO2** layer. The changes of .DELTA.Hk profiles in **plasma** exposure were obtained by using ferromagnetic resonance technique. .DELTA.Hk Is enhanced not only at the surface but also deep in the implanted layer. This effect is probably due to the diffusion of the residual H into the implanted layer.

CC 77-3 (Magnetic Phenomena)
Section cross-reference(s): 75

ST anisotropy field implanted garnet; garnet anisotropy **plasma** effect; strain implanted garnet **plasma** effect

IT Magnetic anisotropy
(of yttrium samarium lutetium calcium germanium iron garnet ion-implanted films, **plasma** exposure effect on)

IT **Plasma**, chemical and physical effects
(on magnetic anisotropy and lattice strain of ion-implanted rare earth garnet films)

IT 11112-62-2D, solid solns. with yttrium samarium lutetium iron garnets 12023-71-1D, solid solns. with yttrium samarium calcium germanium iron garnets 12023-73-3D, solid solns. with yttrium lutetium calcium germanium iron garnets 12063-56-8D, solid solns. with samarium lutetium calcium germanium iron garnets
(magnetic anisotropy and lattice strain of ion-implanted, **plasma** exposure effect on)

IT 12586-59-3, chemical and physical effects 14782-23-1, properties
(magnetic anisotropy and lattice strain of yttrium samarium lutetium calcium germanium iron garnets implanted with, **plasma** exposure effect on)

IT **1333-74-0**, properties 7440-01-9, properties
7440-37-1, properties **7440-59-7**, properties
(**plasma**, magnetic anisotropy and lattice strain of ion-implanted rare earth garnet films exposed to)

L34 ANSWER 11 OF 11 HCA COPYRIGHT 2001 ACS

101:162288 Selectively etching silicon dioxide with sulfur hexafluoride/nitriding component gas. Bobbio, Stephen M.; Flanigan, Marie C.; Thrun, Kenneth M. (Allied Corp., USA). U.S. US 4465552 A 19840814, 4 pp. (English). CODEN: USXXAM. APPLICATION: US 1983-522437 19830811.

AB SiO2 is selectively etched preferentially over Si or poly-Si in an article contg. a layer of **SiO2** on an **underlayer** of Si or poly-Si by exposing the article to a low-pressure **plasma** gas mixt. discharge. The **plasma** comprises SF6 and a nitriding component (e.g. NH3) in the gaseous phase and the exposure is continued until the SiO2 layer as penetrated. The ratio of SF6 to NH3 is from 17:3 to 1:2. At about 14% NH3, the rates are equiv. for Si and oxide. For higher nitriding gas fraction, the SiO2 rate dominates. The optional addn. of an inert diluent gas (Hr, **He**) does not changes these results. The addn. of H to the mixt. retards the Si etch rate still further and may increase selectivity. The **plasma gas** incorporates **H** in a proportion by partial pressures to the nitriding component of from .apprx.7:3 to .apprx.1:2.

IC H01L021-306; B44C001-22; C03C015-00; C03C025-06
NCL 156643000
CC 76-11 (Electric Phenomena)
IT Nitridation
(agents, **plasma** from sulfur hexafluoride and, in selective etching of silica over silicon)
IT 7440-21-3, uses and miscellaneous
(etching of silica selectively in presence of, **plasma** from sulfur hexafluoride and ammonia in)
IT 7631-86-9, reactions
(etching of, preferentially silicon or polycryst. silicon, **plasma** from sulfur hexafluoride and ammonia in)
IT **1333-74-0**, uses and miscellaneous **7440-37-1**, uses and miscellaneous **7440-59-7**, uses and miscellaneous
(in **plasma** selective etching of silica over silicon in sulfur hexafluoride-ammonia mixt.)
IT 2551-62-4
(**plasma** from ammonia and, in preferential etching of silica over silicon)
IT 7664-41-7, uses and miscellaneous
(**plasma** from sulfur hexafluoride and, in selective etching of silica over silicon)

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L35 ANSWER 1 OF 11 HCA COPYRIGHT 2001 ACS
135:188079 Device and method for carrying out **plasma** enhanced surface treatment of substrates in a vacuum. Wanka, Harald; Weber, Klaus; Roehlecke, Soeren; Steinke, Olaff; Schade, Klaus (Robert Bosch G.m.b.H., Germany; Fap G.m.b.H.). PCT Int. Appl. WO 2001063003 A1 20010830, 15 pp. DESIGNATED STATES: W: JP, US; RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR. (German). CODEN: PIXXD2. APPLICATION: WO 2001-DE730 20010226. PRIORITY: DE 2000-10010016 20000226.
AB The invention relates to a device and method for carrying out **plasma** enhanced surface treatment of substrates in a vacuum. According to the invention, homogeneous, contamination-free layers should be produced on substrate surfaces, and the unwanted coating inside vacuum coating installations can be prevented with little effort. In addn., **etching** processes for processing the substrates or for the **plasma**-chem. **cleaning** of the reactor should not lead to any corrosion or to the pptn. of **etching** products inside the vacuum chamber. To these ends, a reaction chamber is placed inside a vacuum chamber. The reaction chamber in which the actual surface treatment is carried out is addnl. surrounded by a purge chamber. A purge gas is fed through the purge chamber via connections and is carried away again. The purge chamber can completely surround the reaction chamber. It is sufficient, however, if the purge chamber is placed solely on sealing surfaces of the reaction chamber.

IC ICM C23C016-44
ICS C23C016-455; H01J037-32; C30B025-14
CC 75-1 (Crystallography and Liquid Crystals)
Section cross-reference(s): 66, 76
ST substrate vacuum **plasma** enhanced surface treatment
IT **Etching**
Vapor deposition process
(**plasma**; device and method for carrying out **plasma** enhanced surface treatment of substrates in a vacuum)
IT Vapor deposition process
(vacuum; device and method for carrying out **plasma** enhanced surface treatment of substrates in a vacuum)
IT 7782-44-7, Oxygen, processes 10024-97-2, Nitrous oxide, processes
(vapor deposition process gas; device and method for carrying out **plasma** enhanced surface treatment of substrates in a vacuum)
IT 56-23-5, Tetrachloromethane, reactions 75-73-0, Tetrafluoromethane 2551-62-4, Sulfur hexafluoride 7550-45-0, Titanium chloride, reactions 7783-54-2, Nitrogen trifluoride 7803-62-5, Silane, reactions 10026-04-7, Tetrachlorosilane
(vapor deposition process gas; device and method for carrying out **plasma** enhanced surface treatment of substrates in a vacuum)
IT 124-38-9, Carbon dioxide, processes **1333-74-0**, **Hydrogen**, **processes 7440-37-1**, **Argon**, processes **7440-59-7**, **Helium**, processes 7727-37-9, Nitrogen, processes
(vapor deposition purging gas; device and method for carrying out **plasma** enhanced surface treatment of substrates in a vacuum)

L35 ANSWER 2 OF 11 HCA COPYRIGHT 2001 ACS
135:12127 Supercritical compositions for removal of organic material and methods of using same. Vaartstra, Brian A. (Micron Technology, Inc., USA). U.S. US 6242165 B1 20010605, 10 pp. (English). CODEN: USXXAM. APPLICATION: US 1998-141866 19980828.
AB The invention relates to treating of surfaces of an object, e. g., treating wafer surfaces in the fabrication of semiconductor devices and to removal of org. material, e. g., **etching** or **cleaning** of resists, org. residues, etc., from surfaces using supercrit. compo. A method for removing org. material in the fabrication of structures includes providing a substrate assembly having an exposed org. material and removing at least a portion of the exposed org. material using a compn. having .gtoreq.1 component in a supercrit. state. The compn. includes an oxidizer selected from the group of S trioxide (SO3), SO2 (SO2), nitrous oxide (N2O), NO, NO2, ozone (O3), H2O2 (H2O2), F2, Cl2, Br2, and O (O2). For example, the exposed org. material may be selected from the group of resist material, photoresist residue, UV-hardened resist, x-ray hardened resist, C-F contg. polymers, **plasma etch** residues, and org. impurities from other processes. The .gtoreq.1

component in a supercrit. state may be an oxidizer selected from the group of S trioxide (SO3), SO2 (SO2), nitrous oxide (N2O), NO, NO2, ozone (O3), H2O2 (H2O2), F2, Cl2, Br2, and O (O2); preferably S trioxide. Further, the compn. may include a supercrit. component in a supercrit. state selected from the group of CO2 (CO2), NH3 (NH3), H2O, nitrous oxide (N2O), CO, inert gases e.g., N (N2), **He**, Ne, **Ar**, Kr, and Xe; preferably CO2. Further, org. material removal compns. for performing such methods are provided.

IC ICM G03F007-42

NCL 430329000

CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
Section cross-reference(s): 76

IT **Etching**
Oxidizing agents
Photoresists
(supercrit. compns. for removal of org. material contg. supercrit. component)

IT 7446-09-5, Sulfur dioxide, processes 7722-84-1, **Hydrogen** peroxide, **processes** 7726-95-6, Bromine, processes 7782-41-4, Fluorine, processes 7782-44-7, Oxygen, processes 7782-50-5, Chlorine, processes 10024-97-2, Nitrous oxide, processes 10028-15-6, Ozone, processes 10102-43-9, Nitrogen monoxide, processes 10102-44-0, Nitrogen oxide (NO2), processes
(supercrit. compns. for removal of org. material contg. oxidizer)

L35 ANSWER 3 OF 11 HCA COPYRIGHT 2001 ACS

133:255504 Method for **plasma** pretreatment. Anon. (UK). Res. Discl., 436(Aug.), P1324 (No. 436003) (English) 2000. RD 436003 20000810. CODEN: RSDSBB. ISSN: 0374-4353. PRIORITY: RD 2000-436003 20000810. Publisher: Kenneth Mason Publications Ltd..

AB A new method to **clean** substrates to be coated by a **plasma** process is disclosed and preferred process range on metals and hard materials are outlined. In a vacuum chamber **H2** or nobel gases (**Ar**, **He**, Kr) atm. the substrates (tools or machine parts) are exposed to ion bombardment. In the following the **cleaning/etching** process is interrupted and a **plasma** assisted coating process can be started, favorably within the same vacuum chamber. Optionally process steps like heating, **cleaning/etching**, and coating can be supported by magnetic fields to conc. or distribute **plasmas** more uniformly.

CC 56-6 (Nonferrous Metals and Alloys)

ST metal **plasma cleaning** coating

IT Coating process
Ion bombardment
(method for **plasma** pretreatment of metals prior to coating)

IT Alloys, processes
Metals, processes
(method for **plasma** pretreatment of metals prior to coating)

IT **Cleaning**
(**plasma**; method for **plasma** pretreatment of metals prior to coating)

L35 ANSWER 4 OF 11 HCA COPYRIGHT 2001 ACS
133:11811 **Plasma precleaning** with **argon**, **helium**, and **hydrogen gases** in forming interconnections of integrated circuits. Cohen, Barney M.; King-Tai, Ngan Kenny; Li, Xiangbing (Applied Materials, Inc., USA). PCT Int. Appl. WO 2000034997 A1 20000615, 21 pp. DESIGNATED STATES: W: JP, KR; RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE. (English). CODEN: PIXXD2. APPLICATION: WO 1999-US27829 19991123. PRIORITY: US 1998-206027 19981204.
AB The present invention provides a method and app. for **precleaning** a patterned substrate with a **plasma** comprising a mixt. of **argon**, **helium**, and hydrogen. Addn. of **helium** to the gas mixt. of **argon** and hydrogen surprisingly increases the **etch** rate in comparison to **argon**/hydrogen mixts. **Etch** rates are improved for **argon** concns. below about 75 % by vol. RF power is capacitively and inductively coupled to the **plasma** to enhance control of the **etch** properties. **Argon**, **helium**, and hydrogen can be provided as sep. gases or as mixts.
IC ICM H01L021-311
ICS H01L021-768
CC 76-3 (Electric Phenomena)
ST **plasma precleaning argon helium hydrogen gas**; integrated circuit interconnection formation **plasma precleaning**
IT Vapor deposition process
(chem.; **plasma precleaning** with **argon** and **helium** and **hydrogen gases** in forming interconnections of integrated circuits)
IT Vapor deposition process
(phys.; **plasma precleaning** with **argon** and **helium** and **hydrogen gases** in forming interconnections of integrated circuits)
IT Electric conductors
Electric contacts
Electric insulators
Inductively coupled **plasma**
Integrated circuits
Interconnections (electric)
Plasma
(**plasma precleaning** with **argon** and **helium** and **hydrogen gases** in forming interconnections of integrated circuits)
IT **Etching**
(**plasma**; **plasma precleaning** with **argon** and **helium** and **hydrogen gases** in forming interconnections of integrated circuits)

IT **Cleaning**
(pre-; **plasma precleaning** with **argon** and **helium** and **hydrogen gases** in forming interconnections of integrated circuits)
IT **1333-74-0**, **Hydrogen**, uses **7440-37-1**, **Argon**, uses **7440-59-7**, **Helium**, uses
(**gas** mixts. contg.; **plasma precleaning** with **argon** and **helium** and **hydrogen gases** in forming interconnections of integrated circuits)
IT 7429-90-5, Aluminum, processes 7440-21-3, Silicon, processes 7440-25-7, Tantalum, processes 7440-33-7, Tungsten, processes 7440-50-8, Copper, processes 7440-56-4, Germanium, processes 12033-62-4, Tantalum nitride (TaN) 25583-20-4, Titanium nitride (TiN)
(**plasma precleaning** with **argon** and **helium** and **hydrogen gases** in forming interconnections of integrated circuits)

L35 ANSWER 5 OF 11 HCA COPYRIGHT 2001 ACS
132:71358 Electrophotographic apparatus using silicon-based photoconductors. Kaya, Takaaki; Sakami, Yuji; Suzuki, Hideaki; Kamibayashi, Makoto; Mikuriya, Hiroshi (Canon K. K., Japan). Jpn. Kokai Tokkyo Koho JP 2000010313 A2 20000114, 25 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1998-174776 19980622.
AB The electrophotog. app. contains a cylindrical photoreceptor comprising an elec. conducting support, a Si-based amorphous photoconductor layers, and a H-contg. amorphous C surface layer. In the app., toner images are formed by using developers with av. particle size 0.004-0.012 mm and toners are recovered and reused. The surface layers may be fluorinated by **plasma etching**. The app. shows good **cleaning** property and gives low-fog images even if spent toners are used.
IC ICM G03G005-08
ICS G03G005-08; G03G021-10
CC 74-3 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
ST electrophotog photoreceptor hydrogenated carbon surface layer; **plasma** CVD hydrocarbon electrophotog photoreceptor coating; fluorination **plasma** surface layer electrophotog photoreceptor; recycling toner electrophotog photoreceptor **cleaning** property
IT **Etching**
(**plasma**, fluorination by; silicon-based electrophotog. photoreceptors having hydrogenated carbon surface layers)
IT Fluorination
Vapor deposition process
(**plasma**; silicon-based electrophotog. photoreceptors having hydrogenated carbon surface layers)
IT 7440-01-9, Neon, uses **7440-37-1**, **Argon**, uses **7440-59-7**, **Helium**, uses 7727-37-9, Nitrogen, uses

(diluents for fluorination gases; silicon-based electrophotog. photoreceptors having hydrogenated carbon surface layers)
IT 75-10-5, Difluoromethane 75-38-7, 1,1-Difluoroethene 75-46-7, Trifluoromethane 75-73-0, Tetrafluoromethane 76-16-4, Hexafluoroethane 116-14-3, Tetrafluoroethene, reactions 593-53-3, Fluoromethane 2551-62-4, Sulfur hexafluoride 7664-39-3, Hydrogen fluoride, reactions 7790-91-2, Chlorine trifluoride
(**plasma etchants**; silicon-based electrophotog. photoreceptors having hydrogenated carbon surface layers)
IT **1333-74-0**, Hydrogen, uses 7782-41-4, Fluorine, uses
(silicon-based electrophotog. photoreceptors having hydrogenated carbon surface layers)

L35 ANSWER 6 OF 11 HCA COPYRIGHT 2001 ACS
130:260787 **Cleaning** of contamination from electron-emissive elements. Knall, N. Johan; Porter, John D.; Stanners, Colin D.; Spindt, Christopher J.; Bascom, Victoria A. (Candescent Technologies Corporation, USA). PCT Int. Appl. WO 9917323 A2 19990408, 38 pp. DESIGNATED STATES: W: JP, KR; RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE. (English). CODEN: PIXXD2. APPLICATION: WO 1998-US18509 19980922. PRIORITY: US 1997-940873 19970930.
AB Multiple procedures are presented for removing contaminant material from electron-emissive elements of an electron-emitting device. One procedure involves converting the contaminant material into gaseous products, typically by operating the electron-emissive elements, that move away from the electron-emissive elements. Another procedure entails converting the contaminant material into further material and removing the further material. An addnl. procedure involves forming surface coatings over the electron-emissive elements. The contaminant material is then removed directly from the surface coatings or by removing at least part of each surface coating.
IC ICM H01J
CC 76-12 (Electric Phenomena)
Section cross-reference(s): 66
ST **cleaning** electron emitter
IT Cathodes
Cleaning
Coating process
Contamination (electronics)
Optical imaging devices
Plasma cleaning
(**cleaning** of contamination from electron-emissive elements)
IT Dielectric films
Etching
Photolysis
Surface oxidation
(in **cleaning** of contamination from electron-emissive

elements)
IT Aldehydes, uses
Aliphatic alcohols
Alkanes, uses
Alkenes, uses
Alkynes
Hydrogen halides
Ketones, uses
(in **cleaning** of contamination from electron-emissive
elements)
IT Carbides
Oxides (inorganic), processes
Silicides
(in **cleaning** of contamination from electron-emissive
elements)
IT 7439-98-7, Molybdenum, processes 7440-02-0, Nickel, processes
7440-05-3, Palladium, processes 7440-06-4, Platinum, processes
(**cleaning** of contamination from electron-emissive
elements)
IT 50-00-0, Methanal, uses 56-23-5, Carbon tetrachloride, uses
64-18-6, Formic acid, uses 64-19-7, Acetic acid, uses 66-25-1,
Hexanal 67-56-1, Methanol, uses 67-64-1, Acetone, uses
67-66-3, Trichloromethane, uses 74-82-8, Methane, uses 74-85-1,
Ethene, uses 74-86-2, Ethyne, uses 74-87-3, Chloromethane, uses
75-09-2, Dichloromethane, uses 75-10-5, Difluoromethane 75-73-0,
Carbon tetrafluoride 79-09-4, Propionic acid, uses 111-27-3,
Hexanol, uses 111-65-9, Octane, uses 124-38-9, Carbon dioxide,
uses 302-01-2, Hydrazine, uses 593-53-3, Fluoromethane
630-08-0, Carbon monoxide, uses **1333-74-0**, Hydrogen, uses
7439-90-9, Krypton, uses 7440-01-9, Neon, uses **7440-37-1**
, **Argon**, uses **7440-59-7**, **Helium**, uses
7440-63-3, Xenon, uses 7446-09-5, Sulfur dioxide, uses
7553-56-2, Iodine, uses 7637-07-2, Boron trifluoride, uses
7647-01-0, Hydrogen chloride, uses 7664-39-3, Hydrogen fluoride,
uses 7664-41-7, Ammonia, uses 7722-84-1, Hydrogen peroxide, uses
7726-95-6, Bromine, uses 7727-37-9, Nitrogen, uses 7732-18-5,
Water, uses 7782-41-4, Fluorine, uses 7782-44-7, Oxygen, uses
7782-50-5, Chlorine, uses 7783-06-4, Hydrogen sulfide, uses
7783-07-5, Hydrogen selenide 7783-09-7, Hydrogen telluride
7783-54-2, Nitrogen trifluoride 7784-42-1, Arsine 7803-51-2,
Phosphorus trihydride 7803-52-3, Stibine 10024-97-2, Nitrous
oxide, uses 10028-15-6, Ozone, uses 10034-85-2, Hydrogen iodide
10035-10-6, Hydrogen bromide, uses 10102-43-9, Nitric oxide, uses
10102-44-0, Nitrogen dioxide, uses 17778-80-2, Atomic oxygen, uses
19287-45-7, Diborane 25377-83-7, Octene 30637-87-7, Hexanone
32073-03-3, Octyne
(in **cleaning** of contamination from electron-emissive
elements)

L35 ANSWER 7 OF 11 HCA COPYRIGHT 2001 ACS
130:190535 Soldering in fabricating an electronic circuit. Nishikawa,
Toru; Satoh, Ryohei; Harada, Masahide; Hayashida, Tetsuya; Shirai,

Mitugu (Hitachi, Ltd., Japan). U.S. US 5878943 A 19990309, 32 pp., Cont.-in-part of U.S. 5,816,473. (English). CODEN: USXXAM. APPLICATION: US 1996-753018 19961119. PRIORITY: JP 1990-36033 19900219; US 1991-656465 19910219; US 1992-890255 19920529; US 1994-240320 19940510; US 1995-578054 19951222.

AB In soldering together 2 members of an electronic circuit, after an oxide or contaminated layer has been removed from the surface of a solder or bonding pad, e.g., the members are aligned in an oxidizing atm. Then the solder is heated in a nonoxidizing atm. to melt the solder and bond the members. **Cleaning** of the solder or bonding pad is performed by sputter-**cleaning**, laser **cleaning**, mech. polishing, or cutting.

IC ICM H01L021-60
ICS B23K001-00

NCL 228205000

CC 76-3 (Electric Phenomena)

ST soldering electronic circuit manuf; **cleaning** solder bonding pad electronic circuit manuf

IT Laser radiation
(**cleaning** by; of solder and bonding pads in fabricating electronic circuits)

IT Solders
(**cleaning** of; in fabricating electronic circuits)

IT Cutting
Polishing
Sputter **etching**
(in **cleaning** of solder and bonding pads in fabricating electronic circuits)

IT **Cleaning**
Plasma cleaning
(of solder and bonding pads in fabricating electronic circuits)

IT **1333-74-0**, **Hydrogen**, **processes**
7440-37-1, **Argon**, processes **7440-59-7**,
Helium, processes 7727-37-9, Nitrogen, processes
(in soldering in fabricating electronic circuits)

L35 ANSWER 8 OF 11 HCA COPYRIGHT 2001 ACS

130:176337 Semiconductor device, its fabrication, and dry **etching** posttreatment. Yabuta, Tetsushi; Ban, Atsushi; Yamakawa, Shinya; Kawai, Katsuhiro; Okamoto, Masaya (Sharp Corp., Japan). Jpn. Kokai Tokkyo Koho JP 11040813 A2 19990212 Heisei, 17 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1997-190248 19970715.

AB The device has the 1st semiconductor thin film corresponding to a channel region and n+-doped the 2nd semiconductor thin film placed between the 1st film and the layer including a source electrode and a drain electrode and characterized by that the leak current Ids between the source and the drain is approximated to Ids .times. L/W = Aexp(-Ea/kT) [Ea = activation energy (eV); k = Boltzmann's const.; T = temp. (K); W/L = size of the semiconductor element; A .ltoreq. 5E - 6 (A) at T = 303-338 (K)] when the gate voltage is in the subthreshold region and the drain current is lower than 1E - 10 (A).

The device is manufd. by a process including dry **etching** for forming contact layer of the source and drain electrodes followed by surface treatment of the element by **plasma** of gas having low reactivity. The surface of the chamber walls for dry **etching** and the surface of the **etched** substrate are treated with the above **plasma** to remove residual **etching** gas and reaction products. The process is suitable for back-channel **etching** of thin film transistor, etc.

IC ICM H01L029-786
ICS H01L021-336; H01L021-3065; C23F004-00
CC 76-3 (Electric Phenomena)
ST semiconductor device fabrication dry **etching** posttreatment; **plasma** treatment residual **etching** gas removal; thin film transistor dry **etching** posttreatment
IT **Plasma**
(of low reactive gas; semiconductor device fabrication including dry **etching** followed by **plasma** surface treatment for **cleaning** of substrate and chamber by)
IT Dry **etching**
Plasma etching
Semiconductor device fabrication
Thin film transistors
(semiconductor device fabrication including dry **etching** followed by **plasma** surface treatment for **cleaning** of substrate and chamber)
IT **1333-74-0**, **Hydrogen**, **processes** **7440-37-1**, **Argon**, processes **7440-59-7**, **Helium**, processes 7664-41-7, Ammonia, processes 7727-37-9, Nitrogen, processes 7782-44-7, Oxygen, processes
(**plasma**; semiconductor device fabrication including dry **etching** followed by **plasma** surface treatment for **cleaning** of substrate and chamber by)

L35 ANSWER 9 OF 11 HCA COPYRIGHT 2001 ACS
126:151740 Method for **cleaning** vacuum treatment apparatus.
Ogawa, Hiroshi (Yamagata Nippon Denki Kk, Japan). Jpn. Kokai Tokkyo Koho JP 08319586 A2 19961203 Heisei, 4 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1995-124890 19950524.
AB After an Al-contg. film formed on a semiconductor substrated is dry **etched** with Cl in a chamber, a gas mixt. of an O-contg. gas, a F-contg. gas, and a Cl-contg. gas is introduced into the chamber and **plasma** is generated therein ro remove the reaction products remaining in the chamber. The preferred gases used for **cleaning** are O3, H2O, H2O2, COx, SOx, NOx, HF3, C2F6, CF4, SF6, Cl2, BCl3, SiCl4, and CCl4. The gas mixt. may be dild. with **He**, Ne, or **Ar**.
IC ICM C23F004-00
ICS C23G005-00; H01L021-3065
CC 76-11 (Electric Phenomena)
ST vacuum treatment app chamber **cleaning**; semiconductor substrate aluminum **etching cleaning**

IT Vacuum apparatus
(chambers; method for **cleaning** vacuum treatment app.)
IT **Cleaning**
Etching
(method for **cleaning** vacuum treatment app. after **etching** of aluminum on semiconductor substrates)
IT Semiconductor materials
(method for **cleaning** vacuum treatment app. after **etching** of aluminum on substrates of)
IT Steam
(**plasma** generation in gas contg.; in method for **cleaning** vacuum treatment app.)
IT 7429-90-5, Aluminum, processes
(method for **cleaning** vacuum treatment app. after **etching** of)
IT 56-23-5, Tetrachloromethane, processes 75-73-0, Tetrafluoromethane 76-16-4, Hexafluoroethane 2551-62-4, Sulfur hexafluoride 7722-84-1, **Hydrogen** peroxide, **processes** 7782-50-5, Chlorine, processes 7783-54-2, Nitrogen trifluoride 10026-04-7, Silicon tetrachloride 10028-15-6, Ozone, processes 10294-34-5, Boron trichloride 11104-93-1, Nitrogen oxide, processes 12624-32-7, Sulfur oxide 12795-06-1, Carbon oxide
(**plasma** generation in gas contg.; in method for **cleaning** vacuum treatment app.)
IT 7440-01-9, Neon, processes **7440-37-1**, **Argon**, processes **7440-59-7**, **Helium**, processes
(**plasma** generation in gas dild. with; in method for **cleaning** vacuum treatment app.)

L35 ANSWER 10 OF 11 HCA COPYRIGHT 2001 ACS
112:66270 Short-period gratings for long-wavelength optical devices. Andideh, E.; Adesida, I.; Brock, T.; Caneau, C.; Keramidas, V. (Cent. Compd. Semicond. Microelectron., Univ. Illinois, Urbana, IL, 61801, USA). J. Vac. Sci. Technol., B, 7(6), 1841-5 (English) 1989. CODEN: JVTBD9. ISSN: 0734-211X.
AB The reactive ion **etching** in InGaAsP and InP were characterized in CH_4-based **plasma**. The role of **H2**, **He**, and **Ar** as diluents were investigated. Highly anisotropic short-period gratings with periods as small as 0.2 .mu.m and with smooth **etched** surfaces are presented. Auger electron spectroscopy was used to delineate a proper processing sequence to obtain **etched** surfaces as **clean** as the surface of control samples. The CH_4/**He** gas mixt. is suggested for the fabrication of gratings as a compromise for achieving good **etched** profiles as well as to minimize hydrogen passivation of donors in **etched** samples.
CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
Section cross-reference(s): 76
ST gallium indium arsenide phosphide **etching** grating
IT Sputtering

(**etching**, ion-beam, reactive, of gallium indium arsenide phosphide and indium phosphide, short-period grating fabrication in relation to)

IT **Etching**
(sputter, ion-beam, reactive, of gallium indium arsenide phosphide and indium phosphide, short-period grating fabrication in relation to)

IT 74-82-8, Methane, uses and miscellaneous
(**plasma**, reactive ion **etching** of semiconductors with)

IT **1333-74-0**, Hydrogen, uses and miscellaneous
7440-37-1, **Argon**, uses and miscellaneous
7440-59-7, **Helium**, uses and miscellaneous
(reactive ion **etching** of semiconductors with methane **plasma** contg.)

IT 12645-36-2, Gallium indium arsenide phosphide 22398-80-7, Indium phosphide, uses and miscellaneous
(reactive-ion **etching** and diffraction grating for emission in)

L35 ANSWER 11 OF 11 HCA

96:14309 **Plasma cleaning** and **etching**.
(Yamazaki, Kyoei, Japan). Jpn. Kokai Tokkyo Koho JP 56123377 A2 19810928 Showa, 7 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1980-26387 19800303.

AB A **plasma cleaning** and **etching** process consists of **cleaning** the surfaces of a substrate (e.g., from a semiconductor material) with an inert gas (or its mixt. with H 0.5-50 flow rate %) activated with induction energy.

IC C23F001-00

CC 76-11 (Electric Phenomena)

ST **plasma cleaning etching** semiconductor material; hydrogen **cleaning etching** semiconductor material

IT **Helium**-group gases, uses and miscellaneous
(**cleaning** and **etching** by **plasma** from hydrogen contg., of semiconductor materials)

IT **Plasma**, chemical and physical effects
(**cleaning** and **etching** by, of semiconductor surfaces)

IT Semiconductor materials
(**cleaning** and **etching** of, by **plasma** from **argon** contg. hydrogen)

IT **Etching**
(of semiconductor surfaces by **plasma** from hydrogen contg. **argon**)

IT **Cleaning**
(of semiconductor surfaces, by **plasma** from hydrogen contg. **argon**)

IT **1333-74-0**, uses and miscellaneous
(**cleaning** and **etching** by **plasma** from **argon** contg., of semiconductor materials)

IT **7440-37-1**, uses and miscellaneous
(**cleaning** and **etching** by **plasma**
from hydrogen contg., of semiconductor materials)

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L36 ANSWER 1 OF 18 HCA COPYRIGHT 2001 ACS
TI Process for ashing organic materials from semiconductor substrates

L36 ANSWER 2 OF 18 HCA COPYRIGHT 2001 ACS
TI Gas barrier packaging

L36 ANSWER 3 OF 18 HCA COPYRIGHT 2001 ACS
TI Process for **plasma** ashing organic materials from substrates

L36 ANSWER 4 OF 18 HCA COPYRIGHT 2001 ACS
TI Purification of crude tantalum by **plasma**-arc melting for ingots suitable for remelting

L36 ANSWER 5 OF 18 HCA COPYRIGHT 2001 ACS
TI Effect of inert and molecular gases on the laser efficiency of a neon-hydrogen **plasma** laser on neon .lambda. = 585.3 nm

L36 ANSWER 6 OF 18 HCA COPYRIGHT 2001 ACS
TI Amorphous hydrogenated carbon films: deposition and characterization

L36 ANSWER 7 OF 18 HCA COPYRIGHT 2001 ACS
TI Interaction of a two-component hydrogen-containing glow discharge **plasma** with palladium and stainless steel

L36 ANSWER 8 OF 18 HCA COPYRIGHT 2001 ACS
TI Silyl (SiH3) radical density in pulsed silane **plasma**

L36 ANSWER 9 OF 18 HCA COPYRIGHT 2001 ACS
TI **Plasma** spraying of zirconia coatings

L36 ANSWER 10 OF 18 HCA COPYRIGHT 2001 ACS
TI Coating of fabrics

L36 ANSWER 11 OF 18 HCA COPYRIGHT 2001 ACS
TI Laser heated gas jet - a soft x-ray source

L36 ANSWER 12 OF 18 HCA COPYRIGHT 2001 ACS
TI Electrical and spectral characteristics of a narrow (submillimetric) electrodeless a.c. discharge in **triple** and quadruple **gas** mixtures

L36 ANSWER 13 OF 18 HCA COPYRIGHT 2001 ACS
TI Large volume **plasma** production by 2.45GHz microwaves

L36 ANSWER 14 OF 18 HCA COPYRIGHT 2001 ACS
TI Decay of the **argon plasma** jet surrounded by **argon**, **helium**, nitrogen and **hydrogen gases**

L36 ANSWER 15 OF 18 HCA COPYRIGHT 2001 ACS
TI Calibrated neutral atom spectrometer for measuring **plasma** ion temperatures in the 0.165- to 10-keV energy region

L36 ANSWER 16 OF 18 HCA COPYRIGHT 2001 ACS
TI Interaction of electron beams with **plasma** in a "probkotron"

L36 ANSWER 17 OF 18 HCA COPYRIGHT 2001 ACS
TI Drift waves in a radio-frequency **plasma**

L36 ANSWER 18 OF 18 HCA COPYRIGHT 2001 ACS
TI Supplementary Rankine-Hugoniot calculations for thermal **plasmas**

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L36 ANSWER 1 OF 18 HCA COPYRIGHT 2001 ACS
134:335369 Process for ashing organic materials from semiconductor substrates. Levenson, Eric O.; Waleh, Ahmad (Anon, Inc., USA). U.S. US 6231775 B1 20010515, 7 pp., Cont.-in-part of U.S. Ser. No. 14,695, abandoned. (English). CODEN: USXXAM. APPLICATION: US 1999-407014 19990928. PRIORITY: US 1998-14695 19980128.

AB Ashing of an org. film from a substrate is carried out by providing a **plasma** comprising a gas or gas mixt. selected from the following groups: (1) SO3 alone; (2) SO3 plus 1 supplemental **gas**; and (3) SO3 plus at least two supplemental gases. Any of the following gases may be employed as the supplemental gas: O2, O3, **H2**, N2, N oxides, **He**, **Ar**, or Ne. Also, a process is provided for forming a **plasma** in a reaction chamber from reactant gases contg. SO3. The process includes introducing the SO3 into the reaction chamber from a storage vessel through a delivery manifold by independently heating the storage vessel and the delivery manifold to a temp. sufficient to maintain the SO3 in its gaseous state or liq. state and by heating the reaction chamber to control the reaction rate of the SO3 and also control condensation of the SO3 to maintain a stable **plasma** state.

IC ICM H01L021-3065
NCL 216067000
CC 76-3 (Electric Phenomena)
Section cross-reference(s): 73, 75, 77
IT Ashing
Liquid crystal displays

Magnetic recording heads
Photomasks (lithographic masks)
Photoresists
Plasma
Printed circuit boards
Semiconductor materials
(process for ashing org. materials from semiconductor substrates)

IT **1333-74-0, Hydrogen, processes**
7440-01-9, Neon, processes **7440-37-1, Argon**, processes **7440-59-7, Helium**, processes
7446-11-9, Sulfur trioxide, processes 7727-37-9, Nitrogen, processes 7782-44-7, Oxygen, processes 10024-97-2, Nitrous oxide, processes 10028-15-6, Ozone, processes 10102-43-9, Nitric oxide, processes 10102-44-0, Nitrogen dioxide, processes 12033-49-7, Nitrogen trioxide
(**process** for ashing org. materials from semiconductor substrates)

L36 ANSWER 2 OF 18 HCA COPYRIGHT 2001 ACS
134:279943 Gas barrier packaging. Watanabe, Haruhiko (Japan). Jpn. Kokai Tokkyo Koho JP 2001114347 A2 20010424, 5 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1999-328615 19991014.

AB Packaging bag or paper carton is vacuumed, loaded with organometallic compd. and/or hydrocarbon gas or gas mixt., and irrad. with high-frequency irradn. or microwave to form gas **plasma** and subsequently a evapd. membrane of metal oxide or diamond-like carbon (DLC) having good gas barrier ability inside the packaging bag or paper carton. The organometallic compd. and/or hydrocarbon gas or gas mixt. is loaded under vacuum to enable the swelling of the packaging bag or carbon and to ensure even formation of the gas barrier evapd. membrane. The method is useful for manufg. packaging materials with long shelf life.

IC ICM B65D081-20
ICS B65D030-00; C23C016-27; C23C016-40

CC 17-4 (Food and Feed Chemistry)

IT Microwave
Packaging process
Plasma
(gas barrier packaging)

IT 71-43-2, Benzene, biological studies 74-85-1, Ethylene, biological studies 74-86-2, Acetylene, biological studies 108-88-3, Toluene, biological studies 110-54-3, Hexane, biological studies 110-82-7, Cyclohexane, biological studies 124-38-9, Carbon dioxide, biological studies 1330-20-7, Xylene, biological studies
1333-74-0, Hydrogen, biological studies
2973-29-7, 1,1,3,3-Tetraethyldisiloxane
3277-26-7, 1,1,3,3-Tetramethyldisiloxane
7429-90-5D, Aluminum, alkyl- 7439-95-4D, Magnesium, alkyl-
7440-37-1, Argon, biological studies
7440-59-7, Helium, biological studies 7440-63-3, Xenon, biological studies 7440-67-7D, Zirconium, alkyl-
7727-37-9, Nitrogen, biological studies 7782-44-7, Oxygen,

biological studies
(**gas** barrier packaging)

L36 ANSWER 3 OF 18 HCA COPYRIGHT 2001 ACS
134:260110 Process for **plasma** ashing organic materials from substrates. Levenson, Eric O.; Waleh, Ahmad (Anon, Inc., USA). PCT Int. Appl. WO 2001024245 A1 20010405, 18 pp. DESIGNATED STATES: W: CA, CN, IL, JP, KR, SG; RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE. (English). CODEN: PIXXD2. APPLICATION: WO 2000-US26400 20000925. PRIORITY: US 1999-407014 19990928.

AB Ashing of an org. film from a substrate is carried out by providing a **plasma** comprising a gas or gas mixt. selected from the following groups: (a) S trioxide alone; (2) S trioxide plus one supplemental **gas**; and (3) S trioxide plus at least two supplemental gases. Any of the following gases may be employed as the supplemental **gas**: O, ozone, **H**, N, N oxides, **He**, **Ar**, or Ne. Also, a process is provided for forming a **plasma** in a reaction chamber from reactant gases contg. S trioxide. The process includes introducing the S trioxide into the reaction chamber from a storage vessel through a delivery manifold by independently heating the storage vessel and the delivery manifold to a temp. sufficient to maintain the S trioxide in its gaseous state or liq. state and by heating the reaction chamber to control the reaction rate of the S trioxide and also control condensation of the S trioxide to maintain a stable **plasma** state.

IC ICM H01L021-311
ICS G03F007-42

CC 76-3 (Electric Phenomena)

ST **plasma** ashing org sulfur oxide

IT Optical imaging devices
(flat panel; process for **plasma** ashing org. materials from substrates using sulfur trioxide mixts.)

IT Ashing
(**plasma**; process for **plasma** ashing org. materials from substrates using sulfur trioxide mixts.)

IT Ceramics
Electric insulators
Liquid crystal displays
Magnetic recording heads
Paints
Photomasks (lithographic masks)
Photoresists
Printed circuit boards
(process for **plasma** ashing org. materials from substrates using sulfur trioxide mixts.)

IT Epoxy resins, processes
Organic compounds, processes
Organic glasses
Organometallic compounds
Polymers, processes

(process for **plasma** ashing org. materials from substrates using sulfur trioxide mixts.)

IT Alloys, uses
(process for **plasma** ashing org. materials from substrates using sulfur trioxide mixts.)

IT Group IIB element chalcogenides
(process for **plasma** ashing org. materials from substrates using sulfur trioxide mixts.)

IT Group IIIA element pnictides
(process for **plasma** ashing org. materials from substrates using sulfur trioxide mixts.)

IT Metals, uses
(process for **plasma** ashing org. materials from substrates using sulfur trioxide mixts.)

IT Nitrides
(process for **plasma** ashing org. materials from substrates using sulfur trioxide mixts.)

IT Oxides (inorganic), uses
(process for **plasma** ashing org. materials from substrates using sulfur trioxide mixts.)

IT Oxynitrides
(process for **plasma** ashing org. materials from substrates using sulfur trioxide mixts.)

IT **1333-74-0**, **Hydrogen**, uses 7440-01-9, Neon, uses 7440-21-3, Silicon, uses **7440-37-1**, **Argon**, uses 7440-56-4, Germanium, uses **7440-59-7**, **Helium**, uses 7446-11-9, Sulfur trioxide, uses 7727-37-9, Nitrogen, uses 7782-44-7, Oxygen, uses 10024-97-2, Nitrogen oxide (N2O), uses 10028-15-6, Ozone, uses 10102-43-9, Nitrogen oxide (NO), uses 10102-44-0, Nitrogen oxide (NO2), uses 11104-93-1, Nitrogen oxide, uses
(**process** for **plasma** ashing org. materials from substrates using sulfur trioxide mixts.)

L36 ANSWER 7 OF 18 HCA COPYRIGHT 2001 ACS
117:94428 Interaction of a two-component hydrogen-containing glow discharge **plasma** with palladium and stainless steel.
Sharudo, A. V.; Mukhamadiev, R. E. (Arifov Inst. Electron., Tashkent, 700143, Uzbekistan). Vacuum, 43(5-7), 623-5 (English) 1992. CODEN: VACUAV. ISSN: 0042-207X.

AB The interaction of a 2-component H-contg. glow discharge **plasma** (q = 3 .times. 1016 ion cm-2 s-1, U = 250-450 V) with **Ar**, **He**, N, and O impurities (Pimp/PH = 0-1.0) with Pd and stainless steel was studied using TPD, DRS, and H permeability techniques. For Pd the rate limiting step for **H** penetration **processes** by glow discharge **plasma** causes an increase in the penetrating flow from 4.2 .times. 1014 to 5.6 .times. 1018 atom cm-2 s-1 (Tmem = 400 K) and from 1.2 .times. 1015 to 4.1 .times. 1016 atom cm-2 s-1 (Tmem = 470 K), resp. The addn. of impurities into the H **plasma** results in a decrease of the penetrating flow by a factor of 2-**3** for inert **gases** and more than an order of

magnitude for impurities of chem. active gases. Changes in the H re-emission rate const., SR, depending on **plasma** compn. was shown for stainless steel surfaces. The re-emission rate const. ranged from 1.58 to 2.63 .times. 10-2 cm s-1 for **He** impurities, from 1.58 to 3.05 .times. 10-2 cm s-1 for **Ar** impurities and from 1.58 to 10.5 .times. 10-2 cm s-1 for N impurities.

CC 55-6 (Ferrous Metals and Alloys)

ST palladium glow discharge **plasma** hydrogen; stainless steel glow discharge hydrogen

IT **Plasma**
(hydrogen-contg., glow-discharged, palladium and stainless steel interaction with)

IT **1333-74-0**, Hydrogen, reactions
(glow-discharge **plasma** contg., palladium and stainless steel interaction with)

IT 7440-05-3, Palladium, reactions 12597-68-1, Stainless steel, uses
(**plasma** interaction with, in hydrogen-contg. glow discharge)

L36 ANSWER 9 OF 18 HCA COPYRIGHT 2001 ACS

112:144292 **Plasma** spraying of zirconia coatings. Varacalle, D. J., Jr.; Smolik, G. R.; Wilson, G. C.; Irons, G.; Walter, J. A. (Idaho Natl. Eng. Lab., EG and G Idaho, Inc., Idaho Falls, ID, 83415-2210, USA). Mater. Res. Soc. Symp. Proc., 155(Process. Sci. Adv. Ceram.), 235-46 (English) 1989. CODEN: MRSPDH. ISSN: 0272-9172.

AB As part of a study of the dynamics that occur in the plume of a thermal spray torch, the deposition of Y2O3-stabilized ZrO2 was examd. Expts. were conducted using a Taguchi fractional factorial design. Nominal spray parameters were: 900 A, 36 kW, 100 std. ft3/ **h Ar** primary **gas** flow, 47 std. ft3/ **h He** secondary **gas** flow, 11.5 std. ft3/h **Ar** powder carrier **gas** flow, **3**.5 lb/h powder feed rate, 3 in. spray distance, and an automated traverse rate of 20 in/s. The coatings were characterized for thickness, hardness, and microstructural features with optical microscopy, SEM, and x-ray diffraction. Attempts were made to correlate the features of the coatings with the changes in operating parameters. Numerical models of the phys. processes in the torch column and plume were used to det. the temp. and flow fields. Computer simulations of particle injection (10-75 .mu.m ZrO2 particles) are presented.

CC 57-2 (Ceramics)

ST zirconia yttria coating **plasma** spraying

IT Coating process
(**plasma**, with zirconia, properties in relation to)

IT 1314-23-4, Zirconia, uses and miscellaneous
(coatings, yttria-stabilized, **plasma** spraying of, properties in relation to)

IT 1314-36-9, Yttria, uses and miscellaneous
(zirconia coatings stabilized by, **plasma** spraying of, properties in relation to)

L36 ANSWER 14 OF 18 HCA COPYRIGHT 2001 ACS
90:178811 Decay of the **argon plasma** jet surrounded by **argon**, **helium**, nitrogen and **hydrogen gases**. Honda, Takuya; Kanzawa, Atsushi (Dep. Chem. Eng., Tokyo Inst. Technol., Tokyo, Japan). Am. Soc. Mech. Eng., [Pap.], 78-HT-12, 8 pp. (English) 1978. CODEN: ASMSA4. ISSN: 0402-1215.

AB An **Ar plasma** jet, having initial centerline temp. of 10,000 K, was ejected into several types of coaxial gas flow, i.e., **Ar**, **He**, N, and H, at low pressure (507 Pa). Anal. and exptl. studies were performed on the centerline decay of the **plasma** jet. The centerline temp. and the degree of ionization varied characteristically with the type of surrounding gases. The differences between monoat. and diat. gases are large and are explained. For monoat. **gases**, the ordinary **three**-body recombination mainly alkyls. On the other hand, for diat. **gases**, a new type **3**-body recombination terminates.

CC 76-4 (Electric Phenomena)

ST **argon plasma** jet decay; **helium** coaxial gas jet; nitrogen coaxial jet; **hydrogen** coaxial **jet**

IT **Plasma**
(jet, **argon**, decay of)

IT Jets
(**plasma**, of **argon**, decay of)

IT **1333-74-0**, properties **7440-37-1**, properties **7440-59-7**, properties 7727-37-9, properties
(decay in surroundings of, of **argon plasma** jets)

IT **7440-37-1**, properties
(**plasma**, jet, decay of)